GAS JOURNAL

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MAINTENANCE

IN these days of high capital costs it is probable that no expenditure is more remunerative than that on the regular and systematic inspection and maintenance of all types of plant. Mr. Morland Fox adopted, for his paper presented to the London and Southern Section of the Institution of Gas Engineers (see later pages), the title 'Preventive Maintenance,' which he derived from the adage 'prevention is better than cure.' A more relevant proverb would seem to be 'A stitch in time saves nine' and as we cannot think of an adjective derived from that we shall contend that it is unnecessary. The object of maintenance is not merely the prevention of breakdown; it should aim at keeping the plant running and/or ready to run at the highest possible efficiency for the longest possible profitable time.

It was contended that the operators of plant should be the 'first line of maintenance personnel,' that maintenance duties should form an integral part of the routine of operation. So far as this means that operators should take an active interest in the condition of the plant they are working on, there will be no disagreement with this view. But it should not be used to minimise the value of a regular system of inspection, and, as soon as the works exceeds a certain small degree of complexity, that of a properly manned maintenance staff. The professional grade of plant engineer might very well be copied from the chemical manufacturing industry. In a gasworks of the larger size he would need at least one assistant specially qualified to deal with carbonising plant, for, while admitting that no effort must be spared to improve the quality of refractories in the first place, there is no part of the works where expenditure on maintenance gives such a quick return as in the retort house.

The position of plant engineer in a modern gasworks should attract a good type of man. It might very well form an essential step in the training of aspirants to the highest operational positions. Its duties call for an originality, a degree of craftsmanship, which is rapidly disappearing from engineering in general and most of all from highly organised production engineering.

Planning of maintenance, says Mr. Fox, does not necessitate elaborate records or a large staff. But it does necessitate a comprehensive scheme of inspection and this calls for what he describes as a plant inventory, though the term inspection schedule would seem to be more appropriate. No part of the plant must be left unvisited at some sufficiently frequent intervals. Bypass and safety valves and connections are often intended only to come into operation in an emergency. If the emergency does not arrive for some months the automatic device may have become rusted up or otherwise rendered inoperative unless in the meantime it has been cleared and free. The duplicate conveyor, pump, engine, motor, and so on may stand too long. It is therefore necessary to work out a schedule to which these duplicates and safety devices are brought into action temporarily to make sure that they will be available when emergency calls upon them.

Mr. Fox illustrated his thesis by many useful examples. The principle is that every plant engineer, in collaboration with plant operators and with his chief, must work out a schedule appropriate to the particular case. This is particularly true of the provision of spare parts. Mr. Fox suggested that 5% of the actual value of the plant should be carried in the form of expendable spares. The figure must not be taken too literally. Suppliers of plant, with their intensive experience of wear and tear on their own apparatus, should be brought into consultation in deciding just what parts are most likely to require replacement, and it is better to keep these parts themselves properly 'maintained' in the works stores, than to rely on the urgent telegram to makers for them after breakdown has occurred.

In our comment on 'Safety and the Unforeseen' (*Journal* of February 25, p.438) we referred to the advisability of building into mechanical plants members from which heavy parts can be lifted expeditiously and in safety. There are still too many cases where tem-

porary and often unsatisfactory tackle has had to be rigged up at short notice to move a heavy worn or broken part at unnecessary risk to personnel and loss of time.

Mr. Fox rightly stresses the importance of regular and appropriate lubrication of all mechanical gear. For this purpose too the provision in the original design of safe access should be stressed. And with this there is the value of insisting on cleanliness. Plant which is clean, outside and in, will generally be in good working condition. In some situations bearings are exposed to heat and the special heat-resisting lubricants recommended by designers and constructors should be strictly adhered to.

The maintenance of refractories in settings and retorts is a problem of its own. The introduction of airborne sealing in the practice of most types of retorts and ovens has provided a convenient means of checking leakage in its early stages. In vertical retorts particularly if carried out with every periodical scurfing it will provide ' operators' maintenance ' and an automatic inspection, pointing out the necessity from time to time of the more drastic methods of hot or cold patching, welding, or spraying. Mr. Fox's remarks, though particularly directed to intermittent vertical chambers, apply equally well to continuous vertical retorts, horizontal retorts, and even to coke ovens and their settings.

Gasworks plant is becoming more and more complex. Some of the later developments will be successful only if the details receive unremitting attention in a routine of inspection and maintenance far more meticulous than was contemplated in the gasworks of a few decades ago. Gas manufacture has become so highly elaborate and mechanical that the attitude of operator and plant engineer must approximate more and more to that of the engine room attendant where every part must be watched over with unfailing solicitude. It has been said that the subject of maintenance is almost inexhaustible. Every operating engineer will be constantly adding to the detail. Above all collaboration with designers and constructors must be sought and welcomed.

OLYMPIAN SPRING

IT is conceivable that in years to come the Ideal Home Exhibition will be regarded as the first sign of Spring, stirring the love birds to thoughts of their first nest, and awakening in maturer creatures speculation on what they are going to do about the front room. It is not so unreasonable. The great mechanical suns of Olympia so play upon the new houses, the profusion of flowers, and the hysterical barrage of propaganda about home making, that anyone who is not conscious of the sap rising must be a hibernator extraordinary. The Ideal Home has become an institution, and although its influence is mainly in the South, it is nevertheless very large indeed. So large in fact that during the run of the exhibition coaches hailing from faraway places may be found parked in the vicinity of Olympia, proof that the ' call ' has reached fervent homemakers one and even two hundred miles away.

Is it any wonder then that many industries, including the gas industry, have long regarded this as the shop window of the year, and with every means in their power have sought to impress the Spring-feverish visitor with the advantages of their particular product? And can one be surprised that the visitor, having been torn this way and that in the frenzy of competitive selling, is lucky to escape before total disintegration takes place? The essential point which every exhibitor must consider is what impression the visitor takes away with her (it is usually ' her,' ' he ' comes on sufferance), and supposing she has not taken the plunge and bought something on the spot, what she will remember and on what her desire for possession remains concentrated after the tumult and shouting have died away. About this we have some firm convictions. She will not, we believe, remember the novelty approaches, the erroneous trimmings which caught her eye at the time; instead she will remember those products which appeared to do effectively something which she wanted done.

It was this belief which coloured our approach to the Gas Council's pavilion this year, and which gave us a sense of instinctive relief that there were no novelties, no film tie-ups, no statues, no foreign bodies to make the eye water and so fail to register the essential exhibit. The stand was refreshingly, blessedly simple—albeit the simplicity was one of skilful contrivance rather than intrinsic innocence. It was good exhibitionmanship, as Stephen Potter might say, and it scored. Appliances were shown against a background of glass bricks illuminated by a battery of floodlights and mechanical filters which were secreted in a sort of juvenile Harwell behind locked doors. The sight of gas fires against this warmly suffused background is a sight to be remembered —the very essence of comfort. Other appliances had backgrounds of other colours—not always the right colours, we feel—but they were all pleasing to look at and focused attention on the appliances themselves. The manufacturers have responded nobly and have provided a united front of unassailable strength.

And competition? The electricity people, separated by little more than a length of red carpet—a river of blood to the imaginative!—are by no means inactive. In comparison with the Gas Council stand, that of E.D.A. is more ingenious, more varied, and there is more to it altogether. Its main attraction is a hall of mirrors in which appliances seemingly stretch to infinity. It is surely the last word in optimism to expect a woman confronted with a multitude of mirrors to look at anything but herself—and, after all, few of us can resist a certain curiosity about how others see us. But that very human weakness can be a nasty hindrance to sales, and the electricity stand did not strike us as the selling machine which it was probably meant to be.

Our more detailed impressions of the exhibition appear elsewhere in this issue. This brief comment is by way of being an appreciation of the organisers and designers of our own gas section. The men there are clearly out to sell and their wares should give them every reason for confidence. It is a pleasure to see this forthright approach, a healthy sign of things to come.

CONSUMER REPRESENTATION

LAST THURSDAY'S BROADCAST discussion on consultative councils yielded a few good suggestions but did not carry the theme of 'the public and the board' very far beyond the conclusions reached in Mrs. Mary Stewart's recent Fabian Society pamphlet. It was the task of Alderman J. W. Moore, Chairman of the Southern Gas Consultative Council, to counter the criticisms that (a) the chairman tends to dominate the council because he is a paid member of the board and (b) the board exercises undue power over the council because the secretary is usually a seconded board employee. He pointed out that liaison is essential and no one is better able to effect it than one who is in constant touch with both sides, and that the secretary more often than not comes from a local undertaking and has no direct access to the members and higher officials of the board. Mrs. Stewart herself put in a plea for a neutral meeting place so as to disabuse the public mind of the idea that the councils are not independent bodies but just part of the board machinery, and pleaded for more use of local authorities. But these very local authorities already nominate not less than half nor more than three-fourths of the council members. The councils are still less than five years old, and we hope piously that they are learning gradually to do a useful job of work. There was a suggestion during the discussion that there should not be separate district committees for gas and electricity. Such a suggestion, said the Member for Sevenoaks, pre-supposes a national fuel policy and cuts across the idea of healthy competition between gas and electricity. We wonder. We ourselves doubt whether experience will reveal an ideal arrangement whereby each industry can retain its separate consultative councils, with joint district committtees meeting in the local town hall to deal with consumers' problems in all the fuel industries. Mr. Hugh Gaitskell, a former Minister of Fuel and Power, said in a foreword to Mrs. Stewart's pamphlet that the idea of a combined local fuel committee is particularly attractive. He went further and suggested the replacement in due course of all gas and electricity consultative councils by regional fuel committees, covering coal as well. Why not? And it is not a bit of use for any consultative council to say that its work remains unsung if on controversial questions the Press is dismissed from its deliberations. The closed door is all too frequent—more frequent, it is true, in coal circles than in gas circles. Nevertheless, the gas industry consultative councils are by no means blameless. This sense of fear of exposure does not intimidate, it merely bores, the Press. No wonder the public is not showing excitement.

Letter to the Editor

UNIVERSITIES AND INDUSTRY

DEAR SIR,—In your editorial of February 25 on the above subject you refer to my contribution at the Leamington Spa conference.

Because the sphere of engineering concerned with capital plant construction is not widely understood, I took pains to remind the audience of it, and said that easily visualised examples were 'gasholders, bridges, blast furnaces, power stations, and oil refineries.' In your precis, you unwittingly credited my company with producing this impressive range of products, and I feel a disclaimer is needed. The list was to illustrate an important engineering field and not to record the activities of any one company, least of all my own.—Yours faithfully,

A. G. GRANT.
Whessoe, Ltd.

Darlington,
March 6, 1953.

Personal

Mr. R. W. L. Ramsden has joined the Board of Directors of Brotherton & Co., Ltd. Mr. Ramsden has been Works Manager at the firm's ammonia and sulphuric acid works in Birmingham since 1917.

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Mr. Ronald W. T. Bray, Managing Director of W. E. Bray and Co., Ltd., manufacturers of the well-known range of dozer and loading equipment, will leave England on April 23 on a tour which will embrace a large area of the United States and Canada. Mr. Bray will visit a number of American and Canadian manufacturers to study the latest trends in the design and use of various types of plant, together with manufacturing methods and procedures. It is anticipated that he will be returning from Canada during the latter part of June.

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Mr. D. Eric Rudall, Llanelly, has been appointed Technical Assistant to the Rhyl undertaking. He is a holder of a Higher National Certificate in Metallurgy, and in 1952 received one of the two Alderman Gough prizes awarded annually by the South Wales Institute of Engineers in connection with the National Certificate in Mechanical Engineering. As a popular member of the Lanelly staff, he will take with him not only their good wishes for his future, but also those of the staffs of other undertakings within the Swansea group, for whom he has carried out duties during the past four years.

Mr. Roy F. Hayman, Industrial Gas Development Officer of the North Thames Gas Board, Watson House, has been appointed Industrial Gas Development Officer to the Gas Council, and will take up his new appointment at Gas Industry House on May 1. He was educated at Bancroft School and the University of London, where he gained an Honours Degree in Chemistry, and is F.R.I.C., M.INST.GAS E., M.I. CHEM.E., and M.I.F. He has been a member of the Industrial Gas Development Committee for six years and Deputy Chairman for two years, and he has also been Chairman of the Industrial Editorial Sub-Committee. In his successful career in the gas industry Mr. Hayman has won the Gold Medal of the Institution of Gas Engineers, the Junior Moulton Medal of the Institution of Chemical Engineers, and the Milbourne Silver Medal of the London and Southern Junior Gas Association. He is also a member of the International Flame Radiation Research Joint Committee. After two years with a firm of chemical manufacturers Mr. Hayman joined the Gas Light and Coke Company in 1928 and gained wide experience in the Watson House laboratories on all kinds of domestic appliances. He was seconded to the Ministry of Supply in 1940, and for two years was engaged in the development of chemical defence, and for a further two years on programme planning, distribution, and storage of smoke chemicals. He returned to Watson House in 1944. When he goes to Gas Industry House in May he will be the first occupant of an office to which the Gas Council attaches great importance.

Mr. William Hunt, who claims never to have been late once during 49 years' service, has retired from the staff of the North Western Gas Board at the age of 68. He was retort house foreman at Liverpool.

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Mr. H. A. Coombs, Production Manager at the Oxford undertaking of the Southern Gas Board, retires this week. At the recent annual staff dinner Mr. S. C. Bentley, Engineer and General Manager, on behalf of staff and employees, presented him with a wrist watch and a combination drilling machine, lathe, and saw to help in his hobby of wood and metal model making. Mr. Coombs started his career at Cheltenham and went to Oxford in 1919 after having been at Malvern for a time and having served in the first world war. In making the presentation Mr. Bentley said that when Mr. Coombs went to Oxford the only production plant was on the north bank of the river, and Mr. Coombs took a leading part in the design and erection of a complete new works equipped with modern plant on the south side.

Mr. Edward Harrison, North Shields, chief meter inspector with the Northern Gas Board, has retired on reaching the age of 65. He has received gifts from the indoor and outdoor staffs and the general office staff. Mr. Harrison has spent 47 years in the gas industry.

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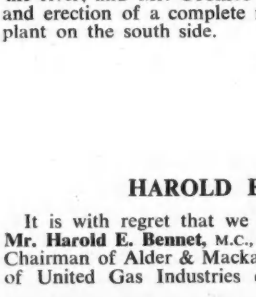
The North Thames Gas Board has announced the following appointments: **Mr. F. R. Darling** to be Deputy Secretary; **Mr. L. W. Smith,** Deputy Chief Accountant; **Mr. J. H. Walker,** Deputy Mechanical Engineer, Beckton; **Mr. A. W. Lamond,** Works Manager, Staines; **Mr. G. C. Smith,** Assistant Products Accountant; **Mr. A. D. L. Copp,** Deputy Distributing Engineer; **Mr. C. D. Shann,** Assistant Distributing Engineer; **Mr. A. K. Shaer,** Divisional Accountant, Eastern Division; **Mr. J. L. Smith, Divisional** Accountant, Central Division; and **Mr. E. G. Elms,** Accountant, Transport Department. It is also announced that the Commercial District will in future form part of the Central Division, and **Mr. H. E. F. Heath** is to be Local Manager, Commercial District.

Obituary

HAROLD EDWIN BENNET

It is with regret that we record the death on March 2, of **Mr. Harold E. Bennet,** M.C., aged 54, of Mona Lodge, Epsom, Chairman of Alder & Mackay, Ltd., Edinburgh, and a Director of United Gas Industries of which companies there was a recent amalgamation of interests. Son of the late John Harper Bennet and grandson of Joseph Bennet, one of the original partners of the company, he was educated at a private school in Edinburgh, of which he became Dux. He served his apprenticeship with Alder & Mackay, Ltd., but this was interrupted to enable him to join the 9th Royal Scots early in the 1914-18 war. He was later gazetted to the Cameron Highlanders with whom he served nearly three years on the Western Front. For his service during the German offensive he was awarded the Military Cross, and he finished up as a Staff Captain in Germany. Following the death of his father Mr. Bennet was elected to the Board of Alder & Mackay, Ltd., in 1919, and three years later he was appointed London Managing Director. He became Chairman of the company last year. He was a Member of the Institution of Gas Engineers, and in 1933 he was Chairman of the Society of British Gas Industries, in which position he was one of the delegates joining in the visit of the Institution to Canada and the United States in that year. At the time of his death Mr. Bennet was Vice-Chairman of the Royal Automobile Club, and for two years—in 1939 and 1940—he had been Captain of the R.A.C. Golf Club. He maintained an active interest in Edinburgh and was a member of the Luffness Golf Club and a member of the Management Committee of the Scottish Conservative Club.



Mr. J. R. W. ALEXANDER writes:—

Harold Bennet had the good fortune to be brought up in an environment of ability, integrity, companionship, and wit—family attributes which he extended to the full during a life that ended so prematurely. A Scot among the English, he remained loyal to the land of his birth and happy among his innumerable friends and associates South of the Border. He was, in fact, a Briton.

Avoiding the limelight but doing outstanding work in the business and social spheres to which he devoted himself, he was everywhere regarded as a wise and trustworthy industrialist and a sterling and happy friend and host. In the meter industry his judgment, sagacity, experience and financial acumen were widely recognised and placed without restraint at the disposal of his colleagues. In tribulation he derived comfort from the knowledge that his dispositions ensured continuance of his company's expansion. For him it was a living organism, not merely an industrial unit.

Bennet's sense of fun and command of the Queen's English made him an ever-welcome raconteur and one upon whom many relied for the replenishment of their store of anecdotes. Among those with whom he associated, his loss is irreparable. Throughout his illness he talked and wrote as if he were free of all cares.

Mr. DENNIS S. GLOVER writes:—

Harold Bennet's passing will leave a sad gap in the lives of many, especially of those who have had the pleasure of knowing him over the years in the gas meter industry. His inexhaustible fund of humour and gay bonhomie endeared him to everyone, but underlying these gifts there was always the serious mind which was ready with sage advice and well-considered counsel. He was enthusiastic in all he undertook, and many friends in the gas industry will remember him as a good golfer and a charming partner or opponent. For many years he was one of the principal supporters of the S.B.G.I. Golfing Circle, of which he was a past Captain. We are all deeply sorry to have lost a staunch friend and a good companion, and shall always treasure the memory of one who has meant much to us whether in or away from business.

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Mr. James Kirk, who died at Auchterarder on March 1 at the age of 74, was a well-known figure in the gas industry in Fife. Prior to his retirement he was Engineer and Manager of the Auchterarder Gas Light Company.

BRITISH ROAD TAR ASSOCIATION

THE BRITISH ROAD TAR ASSOCIATION has recently revised and enlarged its range of lantern slides, sets of which are held by each of the travelling representatives. The work has been done by a sub-committee under the Chairmanship of Mr. A. B. Blunsden, of the Normanby Park Tar Supply Co., Ltd., and the slides now cover the following subjects: Preparation of road tar; Certification Trade Mark scheme; surface dressing; tarred macadam; and dense tar surfacing.

These slides, coupled with a talk and an informal discussion, have proved to be a useful means of imparting information on the latest techniques and have been well received wherever they have been shown.

The travelling representatives will be pleased to show them, by arrangement, to the staffs of surveyors, road contractors and others. Application can either be made to headquarters or direct to the travelling representative for: *Scotland:* (J. W. Milton, Earls Court Hotel, Queen's Road, Aberdeen); *N. England:* (J. M. Leech, 12, Stonehurst Drive, Darlington, Co. Durham); *Midlands and N. Wales:* (P. S. L. Lee, Pye Corner, Moulsford, Berks.); *S. England and S. Wales:* (H. C. Glayzer, 19, Upland Road, Sutton, Surrey).

The representatives have their own equipment including projector and screen.

Diary

March 13.—London Juniors: 'Southampton's Gas Distribution System,' R. K. Harrison. 178/180, Edgware Road, W.2, 6.30 p.m.

March 16.—Eastern G.C.C.: Connaught Rooms, Kingsway, W.C.2, 2 p.m.

March 17.—London and Southern Section, I.G.E.: 'Firing of Pottery Kilns by Gas,' A. F. Searle.

March 17.—Midland Juniors: '25 Years' Experience on a Chemical Works,' H. Alridge, Birmingham. Staff Mess Room, West Midland Gas Board, Council House, Birmingham.

March 18.—Eastern Juniors: Stamford; Visit to the Works of Williamson Cliff Refractory Co., Ltd.

March 18.—South Western G.C.C.: 34, Bridge Street, Taunton, 11 a.m.

March 18.—South Western Section, I.G.E.: Cheltenham. 'Integration and the Scope for Development,' T. W. Jackson; 'Some Aspects of Works Management,' T. N. Dent.

March 18.—Manchester Juniors: Visit to Davyhulme (Manchester) Sewage Works, by invitation of Manchester Corporation Rivers Department. 'Treatment of Industrial Effluent.'

March 19.—London Juniors: All day visit to Chesterfield Works of the Staveley Iron and Chemical Co., Ltd.

March 19.—Wales Juniors (North): Visit to works of C. R. Averill, Ltd., Caergwrle; talk on 'Painting Problems' by a member of the technical staff of C. R. Averill, Ltd.

March 21.—Midland Juniors: Annual Dinner; Imperial Hotel, Birmingham.

March 26.—Midland Juniors: President's Day, Birmingham.

March 26.—North Thames G.C.C.: Westminster City Hall, Charing Cross Road, W.C.2.

March 26.—Northern and Manchester and District Sections, I.G.E.: Joint Meeting and Visit to new Howdon gasworks.

March 26.—East Midlands Sales and Service Circle (Sheffield and Rotherham division): Address by F. E. Sheldon, Sales Superintendent, Sheffield undertaking.

March 27.—Scottish (Western) Juniors: Royal Technical College, Glasgow. Short Paper Night.

March 28.—Western and Wales and Monmouthshire Juniors: Joint visit to Bedwas Coke Ovens, Newport, Mon. Discussion on Coke Oven Gas Supply compared with normal Gasworks Methods of Carbonisation.

April 1.—Eastern Juniors: 'Small Works Practice,' H. W. M. Fiske and E. S. Williams (Members); Peterborough.

April 7.—South Eastern G.C.C.: Katherine Street, Croydon, 2.15 p.m.

April 10.—London Juniors: Discussion on Report of the Gas Industry Productivity Team's visit to America. 178/180, Edgware Road, W.2, 6.30 p.m.

April 11.—Scottish (Eastern) Juniors: Paper by I. M. Anderson. Kirkcaldy.

April 15.—Manchester Juniors: Evening Meeting at Radiant House, Liverpool. Reading of Papers.

April 15.—Eastern Section, I.G.E.: Visit to Peterborough Gasworks.

Home Service Advisers at Main's Works

As a finale to a two weeks course they had been attending in London, a party of home service advisers from various undertakings of the South Eastern Gas Board recently visited the Edmonton works of R. & A. Main, Ltd. Under the leadership of Mrs. Mair Jones, Chief Home Service Adviser, South Eastern Gas Board, they were shown the various processes in the manufacture of the many gas appliances produced at the factory.

The party was entertained to luncheon at the Cooks Ferry Inn, after which the tour continued through the fitting shops, where the various stages in the assembling of the New No. 20 'Century' cooker were explained. Great interest was expressed at the speed and high standard of workmanship which was evident in all departments.

In welcoming the visitors, Mr. J. Wortley, Works Manager, hoped that they had profited by their visit, and in particular that they had noticed the care taken in the production of the many individual components which together make up the completed appliance. The name Main, he said, was synonymous with quality and craftsmanship and they did not intend to allow that high standard to be lowered.

Mrs. Mair Jones thanked R. & A. Main, Ltd., for their hospitality and said that they had all had a thoroughly enjoyable and instructive day which would be of great help to the ladies when they returned to their respective undertakings.

SPECIAL VISIT TO BRISTOL

The Parliamentary Secretary of the Ministry of Fuel and Power, the Hon. L. W. Joynson-Hicks, visited Bristol, on February 10, to inspect the extensions at the new Stapleton Road gasworks, and visit the Industrial Gas Exhibition. It had been intended that the Chairman and Deputy Chairman of the Gas Council should accompany the Parliamentary Secretary, but that was the date on which Sir Harold Smith received the accolade of knighthood from the Queen. As it was impossible for Sir Harold Smith to visit Bristol on that day, he and Mr. Henry Jones made a special visit on Thursday, February 19, when they were blessed with better weather for inspecting the works. In the afternoon they visited the Indusrial Gas Exhibition and, subsequently, other sub-divisions in the Northern Division of the Board's area.

Left to right: J. A. Newton (Chief Draughtsman and Clerk of Works), L. A. Ross (Station Engineer), D. W. G. Scott (Production Engineer, Bristol Sub-division), W. J. Baker (Manager, Northern Division), C. R. Ingham (Manager, Bristol Sub-division), Henry Jones, Sir Harold Smith, T. W. Clapham (Production Engineer, Northern Division), C. H. Chester (Chairman, South Western Board), J. H. Parker (Assistant Production Engineer, Bristol Sub-division), and James Carr (Area General Manager).

Claim Against Gas Board Fails

JUDGMENT was given by Mr. Justice Byrne for the Eastern Gas Board on February 27 in an action in which Ernest Coote, an employee of the former Luton Gas Company, claimed damages for personal injuries and loss caused by alleged breaches of duty under two sections of the Factories Act, 1937. The defendant Board denied negligence and breach of duty and also contended that the action was barred by the provisions of Section 14 of the Gas Act, 1948, which in certain circumstances reduced the period of liability from six to three years. On that point His Lordship held that the action was not statute-barred under the Gas Act.

The plaintiff's evidence was that he was a stoker in a vertical retort house at Luton where his employers, in closing up air spaces to comply with black-out regulations during the war, had failed to make effective or suitable provision for adequate ventilation or for rendering harmless all fumes, dust, and other impurities likely to be injurious or offensive. Coote claimed that because of these circumstances he developed bronchitis and emphysoma and had been unable to work as a stoker since 1948. The writ in the action was issued in October, 1949.

Delivering judgment for the Board, Mr. Justice Byrne said he had been satisfied by important evidence from the inspector of factories that the ventilation of the premises was adequate. Although there was an unpleasant smell it was not offensive or injurious in the sense indicated. The plaintiff had not established that the defendants were in breach of either section of the Factories Act, and there must therefore be judgment for the defendant Board.

The Chancellor of the Exchequer is to open a national conference on productivity in industry on March 19 in London. The main object is to explain and discuss the plans of the British Productivity Council, which was formed last year to replace the Anglo-American Council on Productivity. Invitations have been sent to members of all the teams which visited the United States to study American methods under the auspices of the Anglo-American Council and to representatives of the employers' organisations and trade unions which sponsored the teams. It is expected that several hundred people, drawn from a wide range of industries, will attend.

Chesterfield Rural District Council, after re-consideration, has agreed to adhere to its decision not to provide a gas service for the 124 Trusteel houses which are being built for the Council at Wingerworth, Derbyshire. The East Midlands Gas Board had expressed concern at the Council's decision and had offered, without making any reduction in the number of gas points in each house, to provide gas at £11 per house instead of at the original quotation of £13 per house.

Water Heating Lectures

A SERIES OF LECTURES was given in the Sheffield area by Mr. F. Taylor, Chief Instructor, Ascot Gas Water Heaters, Ltd., on February 17, 18, and 19.

On the afternoons of these days Mr. Taylor lectured on 'Water Heating' to the district representatives, gasfitting foremen, and maintenance personnel of the Sheffield undertaking at Commercial Street, Sheffield.

On the evening of February 17 in arrangement with the education authority of Sheffield he lectured to the gas students at the Technical College, Salmon Pastures, as well as presenting a film entitled 'Symbol of Service,' when there was an attendance of over 80. On the evening of February 18, he repeated this lecture to the master plumbers and the plumbing students of this city. The field covered by Mr. Taylor included the evolution, design, installation, and technical improvements of water heaters, including the balanced flue.

Foxes and Lambs

DARTMOOR SHEEP FARMERS have expressed great concern about the risk of foxes killing lambs. The *West Briton* for February 19 reported that Mr. S. H. Eva, a Camborne former, has provided a novel answer to their worry. 'On my farm my practice is to keep a little pot of gas tar and a stick in the lambing field,' he says. 'Gas tar, which is obtainable from the nearest gasworks is a sure preventive; do not depend on any other sort of tar or oils. Foxes will not touch gas tar. Every morning all the lambs born since the previous morning have a spot of gas tar about an inch wide put on their rumps with a stick. This need only be done once. I have never had lambs touched by foxes when this was done.'

Mr. Eva also says a fox will never touch newly-born lambs; he likes them to run first. But a badger will have them soon after they are born. 'If you find a lamb with his head eaten off, that is definitely the work of a badger.'

BRISTOL INDUSTRIAL GAS EXHIBITION

We dealt in some detail in the JOURNAL *of February 11 with the ambitious exhibition of industrial gas equipment staged in Bristol by the South Western Gas Board and formally opened by the Parliamentary Secretary to the Ministry of Fuel and Power. Above is a view of one section of this comprehensive exhibition, which is claimed to be the largest exhibition of its type to be held in Britain.*

Review of Coal Tar Technology.—Vol. IV, Part I (January-June, 1952), of its 'Review of Coal Tar Technology,' has been published by the Coal Tar Research Association, and may be obtained by non-members from the Association (Oxford Road, Gomersal, near Leeds), price 7s. 6d. Covering 81 pages, exclusive of index, it gives a concise survey of the literature of the period on the scientific and technical aspects of coal tar and coal products and on the relevant general chemistry and chemical technique. Reference is made to a patent granted to Midland Tar Distillers for the purification of naphthalene by the passage of the material into methyl alcohol from which the pure crystals separate out.

The Minister of Materials has made the Control of Sulphur Order, 1953, revoking, with effect from February 23, all statutory control on the supply and use of sulphur, except for the manufacture of sulphuric acid. It has been possible to do this, says a Ministry of Materials announcement, because of an increase in world production of sulphur, and because of economies in its use and its substitution by other materials, such as pyrites and anhydrite, in the manufacture of sulphuric acid. Sulphur was still not available in unlimited quantities, but, provided that economy in its use continued, including all possible means to ensure its recovery in industrial processes, sufficient should be obtainable to meet the essential needs of the U.K.

CONSULTATIVE COUNCILS

Repercussions of the Coal Price Increase

North Western Up a Penny

MR. D. P. WELMAN, Chairman of the North Western Gas Board, announced an immediate increase of a penny per therm in the price of gas at a meeting of the North Western Gas Consultative Council in Manchester on March 2. The increase, which is additional to the average rise of 1½d. per therm which came into operation in January, was necessitated by the 10% increase in the pit-head price of coal as from March 2. The new rise will mean an increase of about 10s. a year on the account of the average household using about 30 therms a quarter.

Members of the Consultative Council charged the National Coal Board with 'discriminating unfairly against the gas industry in its coal prices.' The Council resolved that 'a protest should be made to the Minister of Fuel and Power in respect of the coal prices charged to the gas industry.'

Handicap to Industry

The Chairman, Alderman C. E. P. Stott, said that though the Council accepted the increase as inevitable, it felt that coal prices charged to the Gas Board were pressing gas 'out of service,' and that the N.C.B. should re-examine its policy. The extra charge could be another handicap to industry and commerce and would be seriously felt by the householder. The Gas Board should also review its own economy and try to increase efficiency.

Mr. Welman told the Council that the average delivered price of coal had now risen to 81s. 2d. a ton with the recent price increase. The additional cost to the Board over a full year would amount to £1,341,377. He did not know how the Coal Board arrived at its prices. The percentage method of increasing coal prices now practised by the Coal Board had effectively altered the price structure which it laid down 18 months ago, and had changed the price differentials fixed between different qualities. This meant that the electricity industry would face an increased charge of no more than 3s. 7d. to 5s. 7d. a ton for its coal against the Gas Board's 6s. 2d.

The Chairman of the Coal Board had said recently that coal prices had reached their limit.

'As a result of this increase in our raw material—which makes up 40% of gas producing costs—I say we have also reached the limit of our prices,' said Mr. Welman.

'On the same day that the Gas Board announced its increase the North Western Electricity Board stated that it would not increase its tariffs any further at present. I expressed the view that every endeavour should be made to break the spiral of rising costs, prices, and wages, and that it is the duty of a nationalised industry to maintain the lowest possible prices to its customers consistent with the fulfilment of statutory obligations.'

Sir Joseph Hallsworth, Chairman of the Electricity Board, said at a Press conference that the cost of the recent coal-price increase to the industry nationally would be some £10 mill.; to the North Western Board it would be £1.2 mill. The Board could recover half of that from industry because of a 'coal-price variation' clause in its contracts. It hoped to recover the other £600,000 by a new sales drive in which it would try to 'fill up the valley'—to sell more electricity during off-peak periods.

Mr. Welman told the Gas Consultative Council that in the December quarter of 1952 the recovery of sales, of which the first signs had been noted in September, became more pronounced. Prospects for the financial year as a whole appeared much more favourable than could at one time have been expected. Since then, however, largely because of higher average temperatures in January and February as compared with 1952 the level of gas supply had dropped back and the outlook remained uncertain.

The average weekly tonnage of coal carbonised in the December quarter was 84,900 tons or just under 5% more than in the corresponding quarter of 1951. For the first nine months of the financial year (April-December, 1952) coal carbonised showed an increase of 0.9% over the corresponding period of 1951.

Increased Gas Output

Output of gas averaged 1,730 mill. cu.ft. per week, an increase of 7.4% over the corresponding quarter of 1951, showing a very substantial improvement over the September quarter when the increase was less than 1%. Gas purchased from outside sources averaged 43 mill. cu.ft., giving a total of 1,773 mill. cu.ft. available for sale. This was 7.2% more than the total gas available in the corresponding period of 1951, compared with an increase of only 0.9% in the September quarter.

At the end of the first nine months of the current financial year the total of gas available was just under 2% above the corresponding period of 1951. Two factors contributed to the recovery of gas sales in the December quarter. First, average temperature was considerably lower than in the previous year. Secondly, gas sales shared in the general recovery of demand in the North West since the textile position began to improve. Evidence of this recovery was given in the movement of the Board of Trade index of sales by large retailers for October and November, 1952, which showed increases of 9% and 14% in the value of sales of non-food merchandise compared with 1950, whereas in the corresponding months of 1951, sales had been down by 9% and 3% respectively.

Coke output for sale averaged 34,200 tons per week, or 4.6% more than in the corresponding quarter of 1951. Coke sales at 33,600 tons or 10.2% higher than in 1951, showed a marked recovery over the September quarter when sales were 20.7% below the level of 1951. For the first nine months of the financial year coke output averaged 31,100 tons per week or 3.7% more than in 1951, but coke sales, at 25,300 tons a week were 10% below the level of 1951. October was the first month of the financial year in which sales were higher than in 1951.

Coke stocks at the end of December amounted to 287,000 tons. This was the highest level of stocks in any December since 1949. Previous figures were 78,000 tons in 1951, 72,000 tons in 1950 and 236,000 tons in 1949.

Coke Exports

Coke exports in the December quarter averaged 1,762 tons per week. This compared with an average of only 53 tons per week in 1951 (when a Ministerial prohibition prevented free shipment of coke overseas) and 3,808 tons in 1950. As a result of improved coke handling and grading, there has been a marked improvement in the quality of coke exported.

Comparison of the rise in gas and coke output with the increase in tonnage of coal carbonised shows that gas production has risen about 1½ times faster than coal carbonised, while the rise in coke output was only slightly less than that in coal consumption. On balance there has been a further increase in the total yield per 100 therms of coal, oil, and electricity used in processing. For October and November, 1952, the average yield of gas, coke, breeze, tar, and benzole was 74.37% of fuel consumption compared with 72.25% in 1951. This represents an increase of 2.1% in output per unit of fuel consumption.

The value of domestic appliances sold in the December quarter averaged £81,666 per week, or just under 2% less than in 1951. This represents a marked improvement compared with the September quarter when sales were down by 12.7%. Total domestic appliance sales for the calendar year 1952 were valued at £3,791,000 or 11½% less than in 1951. For the first nine months of the current financial year appliance sales averaged £71,296 per week, or 11.1% less than in 1951. Average sales per domestic consumer were down by 12.3% in the same period.

In contrast to the fall in total value of appliance sales the sale of cookers was comparatively well maintained. The number of cookers sold in the December quarter averaged 2,467 per week, or

11¼% more than the average of 2,207 sold in the corresponding period of 1951.

Sales of appliances which carried purchase tax and were subject to hire purchase restrictions were well down. The value of space heating appliances sold was less than half, water heating appliances little more than a third, and washing machines less than a third of sales in the same quarter of 1951.

The third issue of the *Quarterly Bulletin* presented by the Board to the Consultative Council stated that further progress had been made during the quarter in the work of interlinkage, reconstruction, and technical improvement, and proceeded to give details of no fewer than 26 projects completed, in hand, and authorised.

The Board has authorised the installation at Garston works, Liverpool of a 14 mill. cu.ft. per day intermittent vertical chamber plant, together with ancillary equipment for dealing with coal and coke. So far it has not been possible to allocate steel for the construction of the carbonising plant, but sufficient steel is available for the coke plant.

Installation of a carburetted water gas plant with a capacity of 4½ mill. cu.ft. per day at Linacre works will be completed this year. At Southport, the Board has authorised the installation of a carburetted water gas plant with a capacity of 2 mill cu.ft. per day.

The new 5 mill cu.ft. per day production plant at Partington works went into production in December. During that month Partington produced the record output for the works of 24 mill. cu.ft. in one day. A new coke handling and storage plant with a capacity of 1,000 tons is now under construction.

A new 15 mill cu.ft. per day coke oven plant has been ordered from Woodall-Duckham and details of construction have been agreed, so that work can begin as soon as the necessary steel becomes available.

The second half of a new 4½ mill. cu.ft. per day vertical retort installation at Bradford Road works is expected to be at work soon. Good progress has been made in the erection of new carburetted water gas plant and a new 6 mill. cu.ft. per day unit of horizontal retorts.

Carlisle Street Lighting Protest

WHEN the Northern Gas Consultative Council held its February meeting it received a deputation from Carlisle City Council, headed by Mr. H. D. A. Roberston (Town Clerk), to protest against the Northern Gas Board's charges for street lighting.

In presenting his Council's case, Mr. Robertson said that Carlisle Council was alarmed at the very large costs which were involved in the Board's street lighting tariffs. They were not influenced in the slightest degree by any notion that in the past, as gas producers, they might have given themselves preferential terms for street lighting charges. They were quite satisfied that they ought to pay a price which was comparable to that paid by other consumers in the same class of consumption.

They were seeking no preferential terms, but felt that they ought not to be treated less favourably than industrial consumers. The Carlisle authority were big consumers of gas and would be bigger when the new technical college was opened. As a street lighting authority they had quite a large number of gas street lamps and there might be more in the future. At the present time some were on full lighting, but others were on half lighting as an economy measure. Mr. Robertson added that municipal rates were going up, costs were rising and his Council considered that it had a public duty to make representations to effect a reduction.

Mr. R. A. Cookson asked if the basis of charging for street lighting was influenced by the cost of installation as compared with other users of comparable quantities. Was it true to say that street lighting could not be compared exactly with an ordinary bulk supply? Was that not a strong argument for justifying an individual basis of charge?

Alderman Joseph Hoy (Chairman of the Consultative Council) agreed that Mr. Cookson's point was correct ar because of the absence of meters for street lighting the Board allowed a special discount.

After the deputation had withdrawn, Councillor N. F. Smith (Blyth) moved, and Alderman Mrs. Adams (Berwick) seconded the motion that no alteration be made in the present system. Mr. Cookson pointed out that if any concession were to be recommended would it be possible for the Board to recover the loss by giving a new kind of tariff which would encourage a greater consumption and thus restore revenue by increased consumption.

Alderman Hoy said it would not increase consumption so far as local authorities were concerned. The Board had stated on several occasions that whatever formula was introduced the same amount of money for public lighting would have to be received as now. It was true that local authorities had the impression that they were carrying some injustice because a lamp was assessed as an individual consumer, but they seemed to have a total disregard of what they received over and above the domestic consumer in the 25% discount. A concession given to one local authority would have to be granted to all, and as there were over 100 authorities in the area the Council would be ill advised to alter the present situation.

It was decided that there should be no alteration in the present system.

Commenting upon the miners' latest wage claim, Alderman Hoy said that unless there was a halt to repeated wage increases in the mining industry, the gas industry would price itself out of business. They were reaching the stage when housewives would find it too expensive to use gas.

Hire Policy for Water Heaters

AT a meeting of the South Eastern Gas Consultative Council on March 3, Councillor A. B. Constable presiding, further consideration was given to an application from the Surrey Federation on Trades Councils that the South Eastern Gas Board be asked to initiate an ordinary hire policy for certain types of water heaters. The Council accepted the Board's view that the hiring of these appliances in prevailing circumstances, particularly in view of ministerial restrictions, was not at present a practicable arrangement, and further that there was no evidence of such appliances being let out on simple hire terms by the London County Council or other local authorities, apart from their inclusion, as a fixture, in the rent of the premises.

An application from the Kent Suburban District Committee for the introduction of a cleaning service for cooking stoves had been referred to the Board, whose view was that there was little or no demand for such a service.

Reporting on a meeting of the General Purposes Committee, the Chairman stated that the Board had agreed to accept a deputation from the Sittingbourne Co-operative Society in the matter of the prevailing tariff rates for bread baking.

The Board's mainlaying proposals for the month of February designed to provide a supply of gas to some 3,000 dwellings was received and noted.

Alderman Farrell (Worthing) gave notice of a proposal that the Board be asked to consider the adjustment of a differential in tariffs operating in the Brighton and Worthing area in accordance with representation made to him on behalf of the Worthing Hospital Management Group.

The meeting was followed by a display of technical films arranged by the South Eastern Gas Board through the Board's Information and Publicity Officer, Mr. A. E. Tullberg.

East Midlands Up 5%

FROM the first meter reading taken after March 16, gas prices in the East Midlands Gas Board's area will rise by 5%. At a meeting at Leicester on March 3 approval was given to the increase by the East Midland Gas Consultative Council.

Mr. Sydney Smith, Chairman of the Board, who asked the Council to approve the increase, said it gave him no pleasure to do so. It was necessary. He reminded the Council that at the last meeting he had said that if the cost of materials continued to rise it would be difficult to avoid putting up the price of gas. The increase in the price of coal by 10% was very much more than anticipated. Since March 17, 1952, when the last revised charges came into operation, he said that the Board had been faced with increased working costs, over which it had no control. Increased salaries, wages, freight charges, coal, and coke would amount to £909,300. Reductions in other items would reduce the amount

by £235,000, which would make the total increases to be met £674,300. An increase of 5% would result in increased revenue of £675,000 in a full year.

Captain J. F. Richardson (Spilsby) said sooner or later gas would be priced out of the market, and there might be some sales resistance, with the result that the increase in revenue might not be as large as was hoped.

Mr. Smith said the Board was very conscious of the position. 'If we get consumer resistance, it will mean that the amount will not be recovered, and that means increasing the price of gas again.'

No Increase in the South

ALDERMAN J. W. MOORE, C.B.E., Chairman of the Southern Gas Consultative Council, announced at a meeting of the Council at Reading on March 4 that the Southern Gas Board had no intention of increasing the price of gas in the immediate future. The working results for the year ended March 31, 1952, he said, were already familiar to the members of the Council, and he was able to state that the anticipated results for the year which would end on March 31, 1953, were sufficiently favourable to enable the Board to decide at its meeting on February 26, despite the 10% increase in the pit-head price of coal as from March 2, to strive to continue through the year 1953-1954 without making any increase in price.

The Council, said Alderman Moore, had been informed from time to time about the closing down of obsolete works, integration, and the supply of gas from more modern neighbouring works at production costs considerably lower than at the old manufacturing stations. There had also been considerable economies in other directions. Everything that could be done with a view to reducing expenditure had been done, and was continuing to be done. The working results for the current year would benefit only to a partial extent from those economies because some of them did not come into being until the year was well advanced. It was anticipated that the industry would benefit from those economies for the whole of 1953-1954, and unless anything of an unforeseen nature occurred during the year the Board was sufficiently optimistic to say that the price of gas would not be increased. The Board had spent a considerable time on that matter, and at the end of the meeting he had asked the Chairman to let him have an official communication for submission to the Consultative Council.

The letter from Mr. A. R. McBain, Chairman of the Board, stated that while the 10% increase in the price of coal was in itself a serious addition to costs which in the past few years had steadily mounted, the Board also had to face the fact that an increase in the price of coal might bring in its train rises in the cost of transport, labour, and materials, the extent of which could not at present be estimated.

Substantial economies already made by the Board had been almost completely swallowed up by continually rising costs, but the Board was determined to keep gas prices as low as possible consistent with the obligation laid upon it by the Gas Act to ensure that revenues are not less than sufficient to meet outgoings. After full consideration, therefore, it had decided that for the time being gas prices should not be increased, and it was the hope of the Board that its continuing endeavour to secure economies and improved efficiency would enable the increased coal costs to be absorbed by the Board and not passed on to the consumer. 'The Council will agree, however, that this decision must be subject to review at any time in the light of the existing circumstances, and particularly in the event of further increases in costs.'

The Chairman said he was sure this news would be welcomed, and he hoped that the newspapers circulating in the area would give it as bold headlines as if there had been a large increase in price, because it was news that would be appreciated by all the Board's consumers.

It was agreed to send a letter of congratulation to the Board on its economical and efficient administration, and the Council also congratulated its Chairman on the conferment on him in the New Year Honours of the C.B.E.

Oxford Situation

Replying to questions, the Chairman said the Board was endeavouring to find a new gasworks site in Oxford which would meet with the approval of all the interested authorities. In the meantime Oxford was receiving gas in bulk from Reading. The Board had reason to believe that that arrangement could continue for some time at any rate without danger of a breakdown in supplies at Oxford or any undue shortage at Reading. It was hoped that the authorities would co-operate with the Board in finding a suitable site.

Complaint about inadequate supplies of gas in the Hampshire village of Crondall were made in a letter to the Council from Rear-Admiral W. L. G. Adams, who stated that especially on Sundays the pressure was so low that cooking by gas was almost impossible, gas fires were unusable, and danger was created by the fact that pilot gas appliances went out.

The Secretary reported that he had ascertained from the Board that the supply position would be improved in the near future. Pipes for new mains had already made their appearance, the Ministry had agreed that the starting date for the laying of the mains should be April 1 this year, and arrangements with the local surveyors were well in hand. The Rear-Admiral had expressed his appreciation of this encouraging news and hoped that the drainage authorities would be equally helpful.

Special tariffs for special purposes were abolished by the Southern Gas Board some time ago, and a new general tariff was based solely on the quantity of gas consumed, with reductions at successive stages. The Consultative Council has on several occasions been asked to consider the special case of commercial users who went to the expense of converting to gas shortly before nationalisation in anticipation of continuing to enjoy favourable rates, but it has consistently upheld the Board in its new tariff.

The latest protest came from the Bridport Co-operative Society, through the South Western Section of the Co-operative Union. The industrial tariff at Bridport starts at 25d. and drops eventually to 21d., after the first 5,000 therms per quarter. The letter stated that the Society had recently changed from coke to gas firing, and the cost for the half year had increased from £170 to £580.

The Council replied that it was not prepared to make any recommendation to the Board to vary the tariff in any way from that fixed in March, 1952.

Housewives Exhibition

THE Torquay Sub-Division of the South Western Gas Board has tried a new approach in arousing consumer interest in country towns where a gas supply is available. Such an occasion recently took place at Totnes, South Devon, where a 'Housewives Exhibition' was staged.

The Civic Hall was hired and what better to cast off gloom than Friday the 13th. The Mayoress gave her support and the Mayor also joined in. A programme of events was planned to cover the whole day from 10 a.m. to 8 p.m. This included three cookery demonstrations, three film shows, three home laundry demonstrations, a cake baking competition, and a display of washable materials and dresses. A mannequin parade was also staged by a local retailer, Haymans, Ltd. Almost 1,000 people attended and the film shown was the Gas Council's home laundry film 'Method and Madness' starring Richard Hearne as 'Mr. Pastry.'

The highlight of the day was the attendance of over 300 children at a special film show given for children on their way home from school. The cookery demonstrations included one for marmalade making. The Persil Home Washing Bureau sent a special demonstrator.

The three prizes for the cake baking competition were presented by the Mayoress of Totnes (Mrs. E. C. Nott), and the Mayor thanked the South Western Gas Board for staging such a bright event.

A display of domestic gas appliances brought fruitful enquiries and special interest was shown in the latest gas cookers. Increased attendance at cookery demonstrations is expected to result from this successful exhibition.

What are the Consultative Councils Doing?

'THE Public and the Board' was the subject of a 'Taking Stock' discussion in the B.B.C. Home Service on Thursday evening, the speakers being Mary Stewart, author of a recent Fabian Society pamphlet on consumers councils and wife of Mr. R. M. M. Stewart, M.P. for East Fulham, J. T. Beresford, Deputy Chairman of the South Western Electricity Consumers' Council and Chairman of its Tariffs Committee which deals with questions of tariffs and publicity, J. C. Rodgers, M.P. for Sevenoaks, and Alderman J. W. Moore, C.B.E., Chairman of the Southern Gas Consultative Council, with Graham Hutton in the chair.

Answering the Chairman's opening question 'What do you do?' Mr. Beresford said the public should know that the councils existed and that they had been appointed by the Minister to do certain jobs. Under their terms of reference they were to consider all kinds of representations from consumers, to deal with any matters referred to them by the area boards, and to consider any matters which the councils themselves thought should be considered. They were learning gradually to do a useful job, and there was obviously no limit to the amount of work they could do.

Insufficiently Publicised

Mr. Rodgers did not think the councils were sufficiently publicised, and he had often wondered why, in rendering their quarterly accounts, the boards did not utilise the reverse side to give information about them.

'We have thought of that in the South West,' said Mr. Beresford, 'and we hope to do something of the kind shortly.' He hoped that as a model M.P. Mr. Rodgers made it a rule to forward all letters of complaint to the local consultative council, and did not go direct to the board.

Mr. Rodgers thought there was a growing suspicion that the councils were public relations officers for the boards, and that instead of being consumers' watchdogs they were merely mouthpieces for the boards.

Mrs. Stewart said Mr. Rodgers was rather exaggerating and making generalisations which could not be supported. Some councils had been rather weak and had perhaps not stood up to their boards as they might have done, but there were many which had persuaded their boards to modify their policy. They had advised their boards before policy had been put forward, and had helped the individual consumer.

Alderman Moore suggested that the criticism about the councils being stooges for the boards came from people who had not been able to get their councils to advocate to the boards a reduction in price to particular classes of consumers, which would make the sale of the commodity uneconomic. There were organisations which would like to be given very special treatment, but if that treatment were granted the domestic consumer would have to pay more for his gas in order to subsidise the people who wanted it at a special price.

Answering a question as to whether it was wise for the chairman of a consultative council to be a member of an area board, Alderman Moore said liaison between the two bodies was essential if the consumer was to have satisfaction, and there was no one better able to put over the consultative council point of view to the board, and the board's view to the council, than the chairman of that council.

Mrs. Stewart said one difficulty was that the consultative councils and consumer committees had so often met on board premises and people therefore thought they were part of the board organisation. Her view was that it would be better to meet on neutral ground.

Mr. Beresford agreed that it was a little unfortunate that the idea of secondment of the secretary of the council from the staff of the board had been allowed to creep in, which, together with the fact that the chairman was an *ex officio* member of the board, led to the idea that the councils were less independent than they should be.

B.B.C. Discussion

Mr. Rodgers said he would like to see the finances of the councils separated from those of the boards, with an independent vote—or grant of money—from the Ministry.

Alderman Moore said in some of the consultative councils there was not sufficient work for a full time secretary. That meant that he spent part of his time doing work for the local gas undertaking—which he emphasised was different from working directly for the board. Usually correspondence was dictated by the chairman, and signed by him, rather than by the secretary. The position, therefore, was that while the secretary had access to and was in consultation with the members of the local undertaking he had no direct access whatever to any member of the board; that was done by the chairman.

On the question of direct grant, Mr. Rodgers said he would like to see the councils have sufficient money to embark on such things as market surveys, to which Mrs. Stewart retorted that if they introduced separate research organisations there would be a danger of setting up another bureaucratic organisation.

When the Chairman asked what in fact Parliament itself could do, Mr. Rodgers said one argument advanced by those who believed in nationalisation was that the industries would be accountable to the public, and that accountability would be to Parliament. Parliament decided from the first not to interfere in the day-to-day working of the industries, but there were two safeguards for Members of Parliament—question time and the adjournment debate—when questions could be raised.

Mr. Beresford said the members of the councils had been chosen by the Minister from all sorts of representative bodies of consumers, and they were expected to look after the consumers' interests. He put it to the team that Parliament itself seldom spent more than 12 hours in a year on discussing the nationalised industries.

Alderman Moore said if money was available the councils could achieve greater publicity than at present. They invited the Press to their meetings and secured a certain amount of write-up, but more could be done with more money, and harassed M.P.s would receive much less correspondence.

The Scarcest Commodity

Mr. Beresford suggested that a select committee of both Houses might investigate this matter. Mrs. Stewart said most M.P.s were already overworked, but Mr. Beresford thought there should be 20 to 30 people, specialists, willing to devote some hours each week to the question, although later he added that as Parliamentary time was the scarcest commodity in the world he thought they could safely leave it to the consultative councils to get on with a useful job of work.

There was general agreement that it would be well if the deputy chairman and perhaps one other member of each consultative council, in addition to the chairman, attended the periodical meetings with the Minister, although it was emphasised that by virtue of his liaison work the chairman was usually the better informed.

Mrs. Stewart, returning to the question of meeting on neutral ground, suggested that local authorities might co-operate by allowing councils to meet in the local municipal headquarters. She went further and suggested some measure of linking up between the various fuel industries.

This, said Mr. Rodgers, pre-supposed a national fuel policy, in regard to which he had strong views on the matter of competition. He felt that a measure of competition between gas and electricity tended to promote efficiency.

The title of the *Engineer Directory and Buyers' Guide* has been shortened to the *Engineer Buyers' Guide*. The 1953 edition, apart from displayed advertisements, contains 370 pages of information, comprising over 16,000 entries arranged under approximately 1,500 classified headings, with 700 cross references to help the user to find what he wants. Entry in the *Guide* is confined to advertisers in the *Engineer* or the *Guide* itself. Each regular subscriber to the *Engineer* receives a free copy of the *Guide;* additional copies are obtainable from the publishers at 5s. each, including postage.

The Best Yet!

FINE GAS PUBLICITY AT THE IDEAL HOME

FOR the 30th time, on March 3, the Ideal Home Exhibition opened its doors to an army of potential customers. Until March 28 the ceaseless flow of visitors will have directed at them the sales technique of 600 exhibitors and will be beguiled by 12 acres of glittering exhibits. This must be one of the most remarkable examples of concentrated selling in the world. And the sordid or inspired (depending which side of the fence you are on) business of selling is so heavily disguised, so embellished with novelties, and so rich in what are proudly referred to as 'spectacles,' that the average visitor must be forgiven for feeling a little bewildered.

This year the *pièce de résistance* is the 'coronation cavalcade,' a 100-ft. replica of the State coach complete with horses, postilions, and all the rest. The general *décor* is appropriate, and in order to give those of our readers who are unable to attend the correct atmospheric description, we cannot do better than quote the inspired official wording: 'One approaches it' (that is, the coach, etc.) 'along a highway of red carpet, 12 ft. wide and 300 ft. long, under impressive ranks of heraldic banners of cities high overhead. Higher still hang rich canopies of gold in two shades edged with ermine, suspended from the Olympian heights, above which, again, is ceiling or "sky" in a haze of royal blue. Beyond it, on the darkened great west gable, shine immense outlines of the royal Lion and Unicorn in soft radiance. High in the opposite gable—over the Addison Road entrance—shines a huge illuminated Tudor Rose, the main part 14 ft. in diameter and the projecting "Twigs" each reaching out another 4 ft.'

Competitive Spirit

From these flights of fancy it may be as well to get our feet on the ground again and consider the place of the fuel industries in all this. To do so we need not stray very far from the cavalcade mentioned above—indeed, it is probably this remarkable equipage which, more than anything else, prevents the gas and electricity industries from coming to blows, separated as they are by no more than the width of the gangway bearing this Royal 'spectacle.' For there is nothing namby-pamby about competition this year—the claws are out.

The Gas Council's pavilion (*Stand* 70), which to our mind is the best for some time, has been planned in separate sections to provide for the display of all types of appliances — water heaters, cookers, space heaters, laundry equipment and coke-fired appliances. This layout enables prospective home-makers to examine with ease a wide range of equipment, and the pleasing method of presentation helps rather than hinders. In so far as the stand has a theme it is 'All the Year Round with Mr. Therm,' and to support this each section of the pavilion has an ingenious decorative background associating the purpose or time of year for which the appliances displayed are most suited. Lighting diffused on to backgrounds of glass brick walls, creates a colourful illusion. For instance there is a curtain of water continuously falling behind the water heating display, space heaters are surrounded by a warm glow against a background of falling snow, golden rays of summer heat form a background to the refrigerator display, and so on.

These effects are produced by mechanically driven filters used in conjunction with arc lights and the effect is excellent. We are a little doubtful whether the full significance of all this is appreciated by the visitor, as some of the effects need a little imagination, but few will deny that the general impression is satisfactory.

Following the good example set last year, the gas pavilion is again supported by a considerable gas section, and we congratulate every one of the ten manufacturers of gas and coke-burning equipment not only on participating in the show, but in doing so in such an effective manner.

Unfortunately a black and white photograph cannot convey the ingenious and pleasing lighting effect obtained with this glass brick 'backcloth' to the cooker display on the Gas Council's stand at Olympia.

Bratt Colbran, Ltd., are certain of wide interest in their new 'Port Royal' convector radiant gas fire, described in last week's *Journal*. The curved emitting surface radiates heat over a wide angle into the room, and it is claimed that overall efficiency is increased by 33% and one therm in four is saved. Considerable prominence is also given to the new 'Heaped' fire which is making its first appearance at the Ideal Home. In general the stand may be said to display its customary elegance, due in no small part to the ever delightful design of this firm's modern and period fireplaces, in which the 'portcullis' gas fires are seen looking their immaculate best. *Stand* 83.

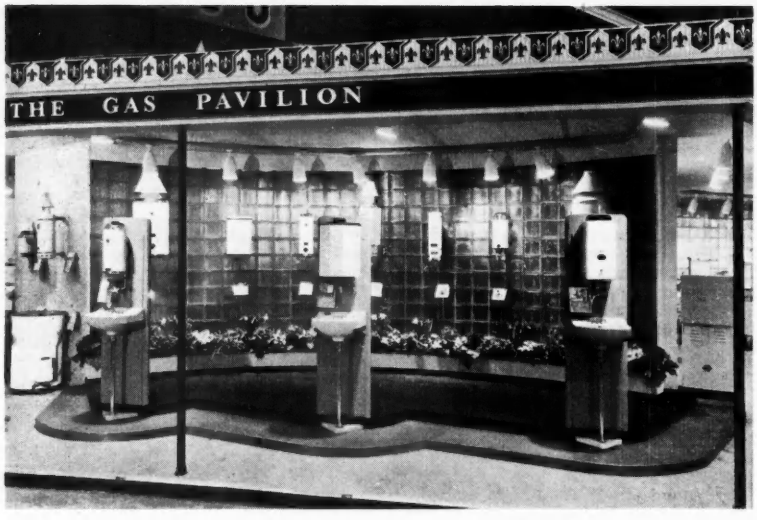
Cannon (Holdings), Ltd., against a tasteful glass and tile background, concentrate on the A.125 cooker. A revolving stand with a 'focus on grilling' theme draws attention to the now well-known eye-level grill which is a particular feature of this appliance, other points being automatic ignition for the four hotplate burners, large oven, drop door, and warming drawer. This is an attractive presentation and should give the interested housewife food for thought. *Stand* 59.

Ewart & Son, Ltd., help to keep water heating by gas in the forefront of public notice with an effective stand which displays three of the firm's best known appliances: The M.210 multipoint, the M.75 sink heater, and the S.140 bath water heater, which is of improved design with a swivel spout to supply hot water to the basin as well as the bath. *Stand* 82.

Sidney Flavel & Co., Ltd., have achieved a certain sense of continuity in the design of their stand by retaining certain features of their last year's exhibit. The bow front is again in evidence, linking up with the unique design of their '68' cooker, and there is a similar emphasis on wrought iron work in the literature stands, etc. But the most striking feature of this very praiseworthy dis-

play is its strong Coronation flavour, contributed by a large colour portrait of Her Majesty and by enlarged coin portraits of the eight other monarchs who have reigned during the firm's 175 years of service. Other appliances on show include the 'Imp' cooker, the 'Metro' series, the 'Newbold' inset grate, and the 'Fulham' finned back boiler. *Stand* 48.

General Gas Appliances, Ltd., with a regal use of scarlet and a nicely executed paper sculpture of a housewife,

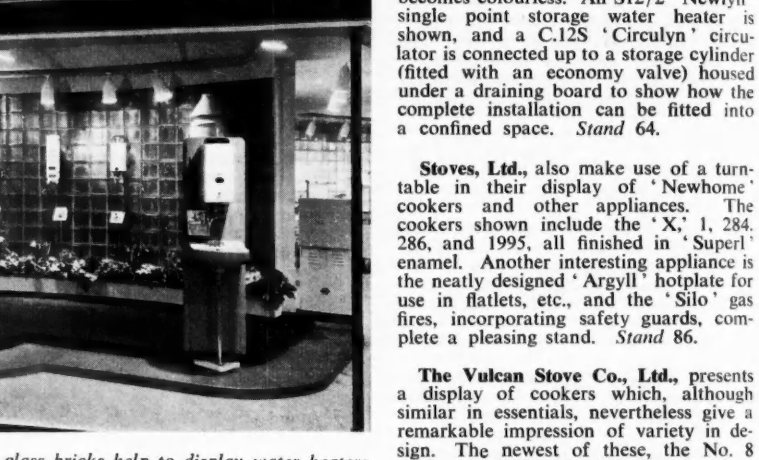


Another section of the stand showing how glass bricks help to display water heaters to good advantage.

display their three cookers to good effect These are the 'Raymond,' which is still one of the most handsome of the 'luxury' cookers on the market, the new 'Victor,' and the 'Junior-General.' Other exhibits include the 'C.R.' fire and the 'Portans' portable fire. *Stand* 61.

R. & A. Main, Ltd., give pride of place to the No. 20 'Century' cooker, models of which are shown both with and without the hotplate side extensions which are available as an 'extra.' Other cookers on show include the No. 57A in cream finish, and cream, and dapple and white versions of the No. 177. The range of water heating appliances displayed represents the complete gamut of water heating requirements, namely: the 'Pronto' instantaneous and 'Thermain' No. 2 storage sink water heaters; the 'M.1.' Multipoint instantaneous and 'Thermain' No. 15 multipoint storage water heaters; the 'New Junior' bath water heater; and the G.L.C. circulator to supplement the source of supply of an existing domestic hot water system for the whole house. Particularly interesting is the new back boiler conversion unit, or 'B.B.U.' Among the wide selection of fires exhibited are the '446' panel fire, the 'Fire King' series of hearth fires and the 'Newscreen' and 'Glowmain' portable models. Other exhibits include the 'Velomain' space heater, the No. 50 gas poker, the No. 231 and No. 254 boiling burners, and the No. 72 rangeplate. *Stand* 45.

Master Gas Cookers, Ltd., contribute what are probably two of the best novelties in the gas section. In addition to an entirely adequate display of the 'Master' cooker in its usual black and cream finish, an all-black model is shown with scarlet taps—a rather saucy combination. We understand that it is included among the firm's exhibit merely to test public reaction. It is a rather daring step to produce a black enamelled appliance after all the propaganda about 'black cookers,' but if the housewife is not prejudiced as a result, she may well see the advantages of this undeniably smart appliance. Of even greater interest



A view of the attractive stand of Radiation Ltd., which is one of the ten stands in the gas section.

is a brand new clothes airing device which, being normally folded back behind the splashplate, can be erected in a second or two. This answers what must surely be 'a long felt want.' *Stand* 71.

Radiation Group Sales, Ltd., have produced just in time for the show the 'Seventy Five' cooker which embraces the same feature of independently-designed oven and hotplate/grill units which was a feature of the 'Eighty Four.' This is in fact a popular price version of that highly individual appliance; it was reviewed in last week's *Journal*. The 'Eighty Four' is also shown, of course, together with the 3518 range, 345TT cooker, and the 1840 and 4180 cookers, and the Radiation range of gas fires is represented. Of particular interest is a glass demonstration unit showing the flow of hot water from the 'Circulyn' circulator into the storage cylinder and the operation of the economy valve. The cold water is chemically treated so that it is blue in colour, and when hot, becomes colourless. An S12/2 'Newlyn' single point storage water heater is shown, and a C.12S 'Circulyn' circulator is connected up to a storage cylinder (fitted with an economy valve) housed under a draining board to show how the complete installation can be fitted into a confined space. *Stand* 64.

Stoves, Ltd., also make use of a turntable in their display of 'Newhome' cookers and other appliances. The cookers shown include the 'X,' 1, 284, 286, and 1995, all finished in 'Superl' enamel. Another interesting appliance is the neatly designed 'Argyll' hotplate for use in flatlets, etc., and the 'Silo' gas fires, incorporating safety guards, complete a pleasing stand. *Stand* 86.

The Vulcan Stove Co., Ltd., presents a display of cookers which, although similar in essentials, nevertheless give a remarkable impression of variety in design. The newest of these, the No. 8 cooker, embodies the broad door which seems to be an increasingly popular feature of modern cooker design. This has not a glass door, but several models included on the stand are equipped with this feature which is so much associated with the Vulcan Company. Fixed and portable gas fires are also shown, as well as grillers and boiling rings. *Stand* 87.

So much for the gas section. There are, however, a number of manufacturers well known in the industry who are not included in this section, and of these we will make brief mention.

Astral Equipment, Ltd., expertly display their well-known 'baby' refrigerator with its capacity of 1½ cu. ft. This appliance can be fitted on a special stand or wall bracket, or stood on a suitable shelf, and it is guaranteed for two years. *Stand* 55.

Easiclene Porcelain-Enamel (1938) Ltd., exhibits the new version of the Easiclene refrigerator with a much improved door handle, and with pale grey replacing the black 'piping' of the earlier model. This handsome appliance has a 4½ cu. ft. capacity, full automatic control and large capacity food locker.

Electrolux, Ltd., include on their stand the new table-top model, with drawer, a 1½ cu. ft. refrigerator with an approximate gas consumption of 26 cu. ft./24 hours and a five year guarantee. Models on display range from this to the large 7 cu. ft. model. *Stand* 88.

Hurseal, Ltd., show their complete range of domestic heating appliances for all fuels. Of particular interest are the well designed radiators which can be tailored in any length or shape and curved or angled to meet requirements. The Hurseal-Hazel domestic boiler is also shown. *Stand* 35A.

Ideal Boilers & Radiators, Ltd., show both gas and solid fuel boilers in a wide range, together with radiators and towel rails and the Ideal 'Neofire,' an open fire which provides background heating and hot water. *Stand* 47.

Janitor Boilers, Ltd., exhibit automatic boilers for domestic hot water and space heating systems suitable for both large and small premises. These appliances are hopper fed and primary air is under the control of a thermostat. *Stand* 56.

Newton Chambers & Co., Ltd., have an excellent display by their Light Castings Department of 'Redfyre' appliances. As well as the well-known 'Redfyre' continuous-burning fires there is an interesting accessory in the 'Redfyre Tidy,' which has been devised to ensure safe handling of the ashpan. *Stand* 78.

During our tour of the exhibition we noticed that the Calor Gas (Distributing) Co., Ltd., have a strong display, that the Coal Utilisation Council had a good audience as well as an interesting and instructional stand, that the Crittall Kitchen Equipment Co. (1950), Ltd.; Easiwork, Ltd., Platers & Stampers, Ltd., and L. G. Hawkins & Co., Ltd., all had excellent displays of pressure cookers, and that the last named was also showing an interesting portable agitator for attachment to a vacuum cleaner to make a washing machine out of a wash boiler, that Nevastane Products had some of the best looking kitchen equipment we had seen, and that the products of Rozalex, Ltd., were well displayed.

The Ideal Home Exhibition is noted for the inclusion of actual houses, built with a speed and degree of care which must surely make the prospective house-owner green with envy. This year the village consists of an inn, a market hall, and six fully furnished houses. Furnishings are in better taste than last year, but one is still grateful for the Council of Industrial Design's good example. The houses provide a magnificent showcase for gas appliances and, speaking from memory, there seem to be more of them this year than ever before. There is good evidence to support the view that more attention is paid to the choice of contents of the houses than to anything else in the exhibition, and if this is true the gas industry may well be pleased with itself.

Gas in the Houses

The Berg house has an Ascot balanced flue multipoint, an Electrolux L.M.150 refrigerator, a Parkinson Mark IV cooker, a Dean 929 washing machine, a Clifford drying cabinet, a Crossland portable fire, a Bratt Colbran 3-unit 'Portello' fire, and 2-unit 'Lutello' panel fire, and a Flavel 2-unit panel fire. In the Davis house is a Sutton No. 2 grate with boiler flue set, and Ascot FA.3 portable fire, a Bratt Colbran 3-unit 'Portello' fire, a Cannon R.7 radiator, a Parkinson 'Nubic' radiator, a Hurseal towel rail, an Ascot balanced flue multipoint, a Radiation 7509 Wenlock 3-unit panel fire, a Flavel 2-unit panel fire, and a Radiation 'Merlin' radiator. The Ministry of Housing and Local Government have in their two-bedroom house a General Gas 'Victor' cooker, a Slaxon 'Washmaid' *de luxe* wash boiler, and a Bratt Colbran 2-unit 'Lutello' panel fire, and in their flat a Radiation S.4180 cooker. The house by Unity Structures, Ltd., includes a General Gas 'Victor' cooker, an Ascot 503 sink heater, and an Allied Ironfounders' 'Era" all-fuel grate. This is by no means the sum total of the gas appliances around the show, they are to be seen on many stands, particularly in the demonstration kitchens sponsored by the Commissioners of Australia and the Hovis bakery.

It will be seen, therefore, that the star of gas is in the ascendant, and that Mr. Therm has probably a better showing than ever before. But this is not to say that electricity does not have a strong display. The British Electrical Development Association portray their story dramatically with kaleidoscopic lighting in halls of mirrors. There are two mirror-lined octagonal halls in which dramatic kaleidoscopic lighting is introduced by colour-mixing fluorescent tubes. One holds nine types of electric cookers and the other nine types of electric water-heaters, everyone multiplied many times. Visitors see themselves multiplied too, and in our view they pay more attention to themselves than to the appliances. From this visitors go on to examine a revolving demonstration of water heating, thence to a range of small electric appliances set in rainbow-lighted honeycomb alcoves, and big appliances on show around an inner hall. There are also three show kitchens, emphasising the attractive properties of timber-lined walls. It is difficult to assess the value of this stand in comparison with that of the Gas Council, its obvious rival. Our view is that the E.D.A. stand is a clever effort, but not a *selling* stand.

Such is the Ideal Home of 1953, a show well up to its usual high standard and something of a triumph for gas.

Company News

GAS PURIFICATION AND CHEMICAL

Dividend 8% (same), plus bonus 2% (nil) for 1952. Net trading profit £26,176 (£17,794), including approximately £4,500 (£2,500) due to realisation of reserves of oxide in loan account. Net profit, after taxation, is £6,930 (£6,115).

DUBLIN

The Directors of the Alliance and Dublin Consumers' Gas Company report that after providing for income-tax, including an additional charge of £7,334 in respect of 1951, surplus on revenue account for 1952 is £84,162 (£82,954). After debenture and temporary loans interest, there remains £67,827. Add investments interest £4,718 and brought in £15,307, available £87,852. Final dividend 3% (same), making 6% (same) for year; forward £20,247.

CORK

The Directors' report of the Cork Gas Consumers' Company for the year ended December 31, 1952, states that after providing £10,000 for depreciation, £3,200 for mortgage debenture redemption and paying an interim dividend of 3% (which absorbed £2,868 15s. 0d.) the balance of profits amounts to £5,190 8s. 2d. It is proposed to pay a final dividend of 3% (making 6% for the year) which will absorb £2,868 15s. leaving a credit balance of £2,321 13s. 2d. to be carried forward.

SOUTH AUSTRALIAN

The South Australian Gas Company's loan of £600,000 at 4⅞% the highest interest rate for a trustee security in South Australia for years, was oversubscribed after three days.

RADIATION LTD.

At their meeting on March 5 the Directors of Radiation Ltd., decided to recommend payment to the ordinary stockholders for the year 1952 of a final dividend of 6⅞% actual, less income tax, on the increased ordinary capital making, with the interim dividend paid in October, a total dividend of 10% actual, the amount distributed being the same as for 1951. The aggregate profits of the Radiation Group for the year 1952 were:—Gross, £818,480 (against £1,262,766 for 1951); less taxation £451,413 (against £729,008) leaving £367,067 (compared with £533,758). The transfer books will be closed from March 9 to 21, both days inclusive.

The Steel Company of Wales has announced plans for big extensions at the Margam works at Port Talbot. One of the main features, a fourth blast furnace, which it is believed will be the largest in the world, will have an output of 10,000 tons a week. To supply coke for the new furnace a further 90 coke ovens are to be built. Other developments include a new power station.

LEAD CYANAMIDE D.K. 825

Abstract of a lecture by Dr. H. ZIRNGIBL, of the Duisburger Kupferhutte.

IT is common knowledge today that the rust-preventive action of systems based on organic binders is mainly due to the combined function of binders and pigment. It is known that the pigment can cause alkaline passivation (by rendering the swelling water alkaline) as well as anodic passivation (in general terms, oxidation of the surface of the iron). A further pigment action is attributed to the improvements of binders by an increase in resistance to swelling of the binder as a result of chemical reaction such as so-called soap formation. Over and above that, the particle shape of the pigment plays a certain part. With the development of high-grade synthetic binders, the importance of protective action due to the binder itself has also been recognised. According to the nature of the pigment or the binder, the main protective function may be due, therefore, to either the one or the other. In systems based on linseed oil, it is the pigment; in synthetic combinations, it is the binder.

The former I.G. at Hoechst works aimed at developing a lead-economising pigment, and solved the problem in 1929 by showing that lead cyanamide was a most effective anti-rust pigment. It is produced by precipitation and is lemon yellow, microcrystalline pigment. It is extremely voluminous and has a needle structure. Its specific gravity is of the order of 6.2 ± 0.1. Lead cyanamide was described for the first time in 1874 by Dreschsel; its chemical composition is $PbCN_2$.

Lead cyanamide is an active anti-rust pigment, along the lines described. It consists of a bivalent lead compound and has the faculty of transforming acidic atmospheric products, such as carbon dioxide, sulphur dioxide, hydrogen sulphide, and the acid decomposition products of linseed oil, into non-corrosive compounds. The cyanamide split off under the influence of acid, due to its tendency to form ammonia, has an alkaline passivating action with water, which is of extreme importance. Lead cyanamide made into a paste with water has a p_H of 9—11. Its alkaline passivating capacity remains unimpaired over many years (proved by Jordan[1] after 6½ years).

The low specific gravity already mentioned and the great bulking volume due to the crystal structure confer valuable technical properties under ready-mixed paints. There is practically no settling in the paints, while, in spite of ready soap formation, lead cynanamide, when incorporated in paint, shows practically no tendency to thickening, the reaction not beginning until oxygen has access to the applied coat. All lead cyanamide paints, including those extended with other pigments, are easily brushable, which makes for good applicability and excellent coverage, at the same time reducing time and labour requirements. Lead cyanamide paints not only possess good hiding power, but have, owing to their easy brushability and high bulking volume a high spreading rate. It is a well known fact that the spreading rate of a paint given equal binders depends largely on the volume taken up by the paint and its behaviour when being applied. The ready-mixed lead cyanamide plant has a specific gravity of only 1.8 to 2. Comparing equal thicknesses of coat, it follows that this larger volume makes for greater coverages. Owing to its high bulking volume lead cyanamide when being made into primers requires what appears to be a relatively high quantity of oil. However, as a correspondingly larger spreading rate is reached with this than with normal paints, the quantity of oil used per unit area in the end works out at the same figure.

The lead cyanamide coating is practically dry throughout after seven days. Particularly noteworthy is its high elasticity notwithstanding its great hardness, a very important property which was found in all paints and coatings compositions pigmented with lead cyanamide. The hardness test by the Clemen-Keyl method shows the greater elasticity of lead cynamide films very clearly. Shavings of the film removed in the test remain intact when lifted even after a prolonged period of observation, which is a sign of very small tendency to brittleness. Connected with this property are high adhesive power and extensibility, which were measured in collaboration with the varnish section of the Farbenfabriken Bayer, Uerdingen works. The above are notable properties of the lead cyanamide films, since the specific requirements for rust protection are non-porous and resistant coats, which nevertheless remain sufficiently elastic so that they do not crack when stressed, as for example when used on riveted steel structures.

Paint films containing lead cyanamide, as a result of the great reactivity with oil and other media containing oil, generally dry very rapidly, and by using suitable driers the drying time may be considerably speeded up. Speeding-up of drying time is obtained also with tung oil to 5% without measurable brittleness of the paint; lead cyanamide paints in alkyd resins are characterised by short drying times and good brushability. Similarly, all activated grades of linseed oil blend very well with lead cyanamide, securing complete dust-free drying within 20 minutes.

A special quality of lead cyanamide was apparent when it was used under top coats which dried solely by solvent evaporation—bitumen, and certain synthetic resin and plastic varnishes. The pigment may be used in oil media beneath such coatings without having to wait any appreciable time before applying the top coat. It is very difficult to give a theoretical explanation for this remarkable property of lead cyanamide, but practice has shown that lead cyanamide/oil primers may be coated immediately after drying with, for instance, bitumen and that the primer will continue to harden perfectly throughout, developing good adhesive power. As special protective qualities are expected of lead pigments, with which soap formation occurs in conjunction with an oil, priming, in so far as lead pigment primers are used, should be done with a medium consisting of or containing linseed oil. Lead cyanamide offers the possibility in this connection of reducing very materially the drying period necessary before nearly air-impermeable top coatings can be applied.

[The pigment is now available in this country, and primers produced from it are available from some of the leading paint manufacturers.]

[1] Korrosion u Metellschutz, 1944, 20, 215: 'New Developments in protection by painting.'

FLAME RADIATION RESEARCH

INTRODUCING a discussion before the Institute of Fuel in London on the work of the Flame Radiation Research Joint Committee, Professor O. A. Saunders (Chairman of the British Committee) said that the aim of the investigations at Ijmuiden, Holland, was to improve the efficiency of industrial furnaces. Results obtained to date by the team of young British, French, Dutch, and Swedish scientists had led to a better understanding of heat transfer processes—in particular of heat transfer by flame radiation.

Heat transfer by radiation from luminous flames was mainly due to suspended carbon particles. We lacked knowledge of the number and size of these particles, and their rate of formation. The problem was a complex one, and could not be studied satisfactorily in the laboratory; investigations were needed on a scale approaching that of the furnaces actually used in industry. Such investigations had been carried out at Ijmuiden over the past four years.

Mr. M. W. Thring (General Superintendent of Research to the Committee) said that the earlier experiments were of two types—'performance trials' and 'combustion-mechanism trials.' In the performance trials the effect on the flame radiation of the following pairs of variables was compared: (*a*) oil and creosote pitch; (*b*) rate of fuel energy input, 76 and 106 therms per hour; (*c*) air and steam as atomising agents; (*d*) an increase of 20% in the quantity of atomising agent; (*e*) an increase of 25% in the quality of combustion air. In the combustion-mechanism trials the object was to measure in great detail the conditions inside the flame, with a view to finding an explanation of the results of the performance trials. For example, the structure and distribution of the soot particles in flames had been studied by means of the electron microscope.

In the second series of experiments (the 'burner trials') the effect on the flame characteristics of using various types of burner was studied.

Preventive Maintenance

By W. MORLAND FOX, B.Sc.,
Director, W. J. Jenkins & Co., Ltd

A paper to the London and Southern Section of the Institution of Gas Engineers

THE title of 'Preventive Maintenance' is derived from the adage 'Prevention is Better than Cure.' This truth applies in a greater degree to plant maintenance than to anything else, even accident prevention. It is the author's opinion that the operation of all plants can and must be planned so that operators themselves are the first line of maintenance personnel, in that their operational duties include maintenance duties as an integral part of the routine. It may seem ridiculous even to mention that regular and correct lubrication is the first requirement for good maintenance, but the fact remains that nearly 50% of breakdowns and renewals are caused by the lack of this essential attention.

The problem of plant maintenance began the day after primitive man built his first hut; it became more acute when he devised his first wheel; it has continued in direct proportion to the increasing fertility of the human race in evolving machines; it has rarely received the attention which it merits and has usually been considered a necessary evil.

Today the high capital cost of new plant and restrictions in capital expenditure have compelled managements to keep plant in full use after the normal time of obsolescence. This calls for greater attention to maintenance to keep unbroken output and to avoid costly emergency repairs. Additionally, improvements in design and materials have resulted in higher productivity of machines with resultant greater loss when breakdown occurs.

While the object of this paper is to stress the necessity for and value of preventive maintenance and to give examples and suggestions, it must be emphasised that the complete planning for effective maintenance must extend beyond the preventive stage. Preventive maintenance must always be the first and indeed the most important item of the programme, a routine which must be as regularly carried out as the basic operation of the unit or plant, at intervals which may be as frequent as once per shift.

The Objective

The objective of preventive maintenance is to keep plant in operation at its highest efficiency, to extend the period between overhauls necessitated by fair wear and tear, and in conjunction with the routine of regular overhaul and renewal, to eliminate major breakdowns.

The timing of periodic overhaul of machines will be determined by such factors as study of reports produced by the preventive routine, working conditions and load factor of the unit, and the schedule of plant operation in relation to necessity of and availability for shut down.

A check must be kept on the cost of 'running' repairs to prevent the cost of maintenance becoming excessive in relation to the cost of replacement. Finally, there must be good provision for dealing quickly and effectively with breakdowns, which will occur notwithstanding the application of preventive and routine maintenance because of flaws in, or fatigue of, materials or the errors arising out of the human factor.

Preparations for dealing with breakdowns consist of ensuring availability of maintenance personnel, tools, tackle and spare parts and of formulating procedures based largely on previous experiences. Planning of maintenance does not necessitate elaborate records or a large staff. A simple system will prevent loss of output through breakdown, will eliminate costly emergency repairs, and will be the basis for determining the decreasing productive value of plant and the policy of obsolescence and replacement.

Plant Inventory

The primary record in maintenance planning is a plant inventory of which copies will be held by the secretarial/accountancy department and the works manager, and will give the identification of the plant or unit by brief description and preferably also by a reference number, its cost and date of installation and the yearly depreciation. In this inventory will be recorded the expenditure on maintenance reported by the works manager so that management can assess the value of the machine in relation to its capital and maintenance cost, and determine the time of obsolescence and replacement.

In addition to this programming, there is the essential necessity for provision and replacement of the necessary spares required for routine renewal and against the contingency of breakdown. The regular and thorough use of a simple stock record system will ensure that spares are maintained in relation to the demand, and the ordering of replacements carried out in time.

Maintenance in a Contractor's Works

It will be appreciated that breakdown of a machine tool and especially of a shop crane may cause a very serious loss of output. The constant care and, in fact, one of the primary duties of a works manager is to ensure that every item of plant is kept in the highest state of mechanical condition so that major breakdowns are eliminated. He must depend on the machine operators for much of the preventive maintenance and will impress on them that their earnings will be affected by avoidable breakdowns; the maintenance gang will constitute an inspectorate as well as the repair unit. The routine carried out in the works of the author's company is briefly outlined.

Machine Tools.—Each operator must devote half an hour per week to the lubrication, cleaning, and checking of his machine; he must report immediately any defect to the maintenance gang who then effect the necessary repair overnight or at the week-end. Additionally, the maintenance fitters make a fortnightly routine inspection of every machine to check lubrication and general mechanical condition and they report on the necessity for overhaul.

Cranes.—The procedure for regular weekly lubrication and inspection by the drivers is the same as for machine tools, but the maintenance fitters carry out a thorough weekly checking examination. Additionally, each crane is fully inspected and tested at every holiday period (at least four times per annum) by the maintenance gang and necessary renewals or repairs carried out. Overhead crane tracks are inspected and necessary renewals or repairs effected every six months. Steam cranes have the boilers washed out at six-monthly intervals and the full insurance inspection is made at yearly intervals. All hoist ropes are examined at three-monthly intervals (by the maintenance gang); hoist and sling chains are annealed, and tested at the scheduled periods.

Electrics.—Every motor is inspected monthly by the maintenance electricians for current consumption under load, bearing lubrication, and the correct functioning of switchgear. At a maximum of six-monthly intervals each motor and starter is given an insulation test, check on bearings and stator/rotor clearance, cleaning of commutator or slip rings

and brushes and a pneumatic blow out to remove dust. Contactor panels are inspected weekly, oil dash pots and time-lag mechanisms checked and contact surfaces cleaned, adjusted and vaselined and renewed when necessary. Dash pot oil is changed twice per annum for the correct summer or winter grade.

Services.—All services and particularly compressed air pipe lines, valves and connectors are subject to a continuous system of inspection by the maintenance gang.

Spares.—Standardisation of motors, switchgear, machine shop tools, cranes, etc., is practised as far as possible and stocks of expendible spares are held at about 5% of the capital value of the plant.

Cleanliness.—The psychological effect on the workmen of tidiness and cleanliness in a works cannot be overstressed. It is essential that a regular routine of removal of swarf, borings, flashings, off-cuts, and all scrap is followed; that floors are swept, windows cleaned, walls, etc., painted or whitewashed regularly.

Erection Tools and Tackle.—Each item covered by the building regulations is recorded in full detail on a card with reference number; this card is filled in with the dates of issue to and return from sites, and of examination, testing and overhaul. The code reference number is clearly marked on each item. Erection superintendents are responsible for preparation and issue of the necessary tackle to contracts under their control, and for the regular return for scheduled testing and overhaul.

Procedure at Sites.—Tackle issued is recorded in a register held at site by the supervisor. Foremen and leading erectors are responsible for examination of each item, particularly of lifting tackle before use; the supervisor makes weekly inspection (as laid down in building regulations) of all lifting devices and enters his report in the register. When tackle reaches its scheduled period for overhaul and testing it is withdrawn from use and returned to works; damaged items must be withdrawn immediately. A label on the item with a duplicate note gives works the reason for return.

It is forbidden to transfer tackle from one site to another; all must be returned to works for examination before re-issue. (The sole exception to this rule are cranes which may not have reached their scheduled time for overhaul, and even then transfer can only be made after sanction by a senior erection superintendent and examination on site by him before transfer.)

Maintenance at Works.—As a check on sites, record cards at head office are examined monthly and site supervisors reminded of items due for return for testing and overhaul; site supervisors indent for replacements if required. All cranes, winches, pulley blocks, chain blocks, and hoists are, on return from sites, completely stripped, the necessary repairs made and the units tested before re-issue. Chains and slings are sent for anneal and test, wire hoisting and guy ropes are fully examined and if flawed are scrapped. Finally, as a further check, a representative of the insurance company visits our works and sites twice per annum, examines all tackle (except sling chains) and reports his findings. This keeps site supervisors and foremen and our erection tackle overhaul shop up to scratch.

Contractor's Service

In addition to the normal supervision of erection and starting-up of new plants, our company carries out a system of service visits at approximately six-monthly intervals with the following objects:

1. To advise on the technique of operation of the plant with a view to the elimination of any trouble or errors and to assist in maintaining the efficiency of operation.
2. To provide the plant user with an independent summary of the condition of the plant.
3. To determine the extent of plant deterioration and advise on maintenance to combat this.
4. To effect a regular exchange of technical information.
5. To maintain up-to-date records in our organisation with a view to eliminating faults and improving design.

The inspection of the plant is as thorough as operational circumstances permit and may take several days to complete. At the end of this inspection our service engineers discuss their findings with the plant superintendent and/or works manager, when it is frequently found that points may have been overlooked by the plant operating staff due to what might be termed over-familiarity with the plant they are now operating. By seeing the plant every day the slow progression of deterioration is not noticeable to the operating staff, but our service engineer sees the difference in the condition of the plant since his last visit, and accordingly details this in his service report which is forwarded to the plant user. Every attempt is made to present an unprejudiced report of conditions and operation exactly as they are found at the time of the visit.

These visits also enable our service engineers to collect and pass on experience which has been gained on other similar plants. The plant superintendent can also be acquainted with the latest developments in operation and design, and advice given on repair and reconstruction programmes and extension projects and on the current position of manufacture and delivery of materials and spares.

Additionally, the service engineer makes a separate report, which goes to the directors of our company, in which he records any errors or weaknesses in our design or construction and his own and the user's suggestions for modification to or improvement of the plant. They are considered and, if approved, are circulated to the appropriate departments in our organisation, where they are recorded for future use.

The inspections and report are made to the following schedules.

Intermittent Vertical Chamber Installations

Results over period.—These figures are obtained from the undertaking's records and must be for a minimum period of one month and preferably one quarter. They include gas made, coal carbonised, yields of gas, coke and tar, weight of charge, coke to producers, coke available for sale, and fuel efficiency index. They enable our carbonising department to assess the relative efficiency of production and operation compared with our initial assessment, and serve as a guide to outputs and yields from similar coals on future plants, and as a basis for dealing with users' queries on technique of operation.

Conditions during visit.—This details the extent of plant at work or under heat, type, size and proximate analysis of coal carbonised, the charging and steaming schedule, foul main and liquor circulation conditions, producer cleaning schedule, maximum, minimum and average heats in all top and bottom flues, with comments on any variation from normal conditions.

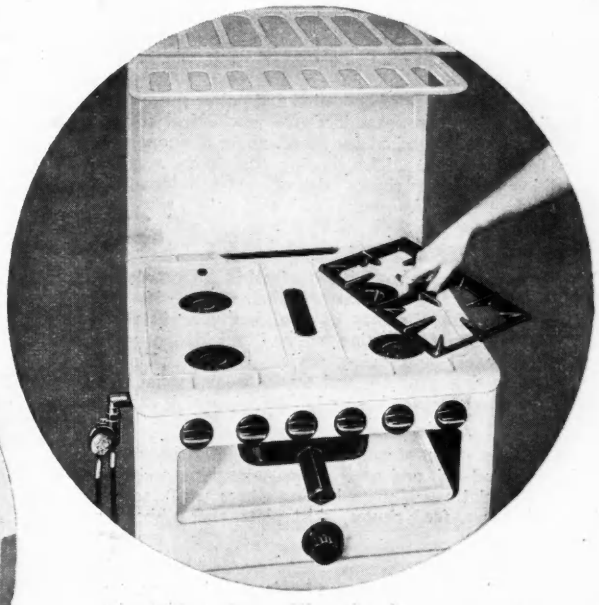
Plant condition.—Each chamber in use is inspected and the condition fully detailed, and its working life since initial start up or since reset recorded. The recuperators are are examined for tightness and dust depositions, and the condition of producer brickwork and fittings reported with a record of any relining or repairs since the last visit. Special attention is given to the routine or scurfing, flue cleaning, the regular washing with refractory cement of the bottom blocks of chambers, and the use of airborne sealing.

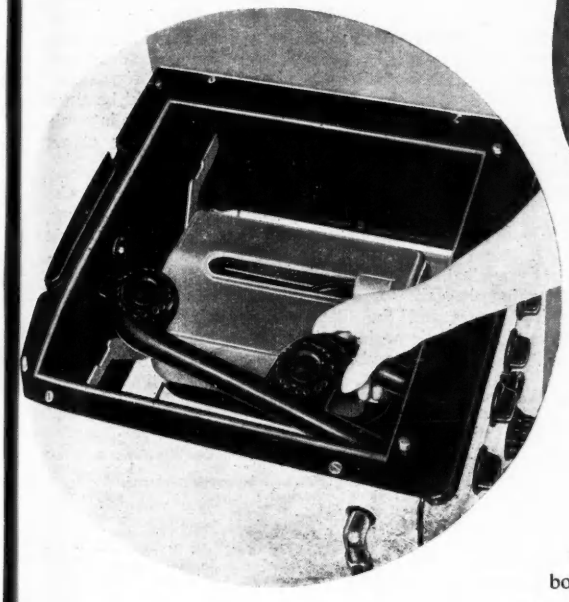
The condition of bench mounting such as top and bottom gas offtakes, hydraulics, foul mains, liquor services and pumps, steam and water services, tie rods, is fully examined; particular attention is given to the bottom doors and door operating gear. Mechanical units such as chamber and producer charging cars, hot coke car and the mechanical handling plant to, in and from the chamber house are all fully inspected.

Finally the service engineer closes his report with a list of recommendations for future operation and maintenance, including if necessary his suggestions for repairs and resetting.

(*Continued on p. 572.*)

Its Hotplate, too, has unique maintenance features





The loose hobplate of the No. 20 CENTURY is fitted with two double pan supports of cast iron, finished in heat-resisting vitreous enamel. These are interchangeable right to left and are reversible back to front. The four high-speed boiling and simmering burners, cast in tandem pairs, are also interchangeable. Thus only one pan support unit and one boiling burner unit need be stocked for replacement purposes.

The quick-heating griller has large frets of heat-resisting steel and these provide a large toasting area. The frets are protected from spillage by a heat-deflecting hooded grill cover. The grill pan has a close mesh cross wire grid to support small pieces of food and is reversible, affording two grilling heights.

The boiling burners (cast in pairs) have a stable three-point support at the injectors and on the burner carrier. The latter is loose and reversible. When in place, it acts as a stop for the correct positioning of the grill pan.

The fixed injectors are recessed behind the cock shield and when all the loose parts have been removed a perfectly clean "wipe out" of the hotplate well is obtained.

A small hole in the right-hand side of the hotplate well provides access to the push button of the governor.

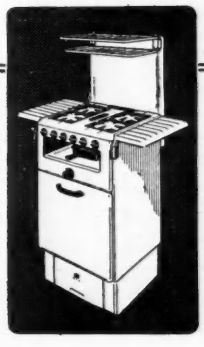
The tap handles and the mainstat numbered knob are "pull-off" types to facilitate removal of the facia plate. The oven tap has a distinctive red marking. Flanges on the taps eliminate possible damage to them during maintenance.

Hotplate Extensions

When supplied, the Extensions are hooked to small brackets fixed at the front and back of the cooker by means of existing screws. The Extensions are interchangeable right and left and are provided with horizontal alignment and levelling screws.

In CREAM Vitreous Enamel

Gas Cooker



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Mechanical Plants

Coke handling and grading plant.—Skip hoists are reported on as to the condition of loading chute, skip and bale, hoist and balance weight ropes, winding drum and gear, bend pulleys, limit switches, track, cycle of operation and power consumption. The grading screens are examined for mechanical condition of drive and frames, checked for speed, angle of supports and freedom from vibration. The loading equipment is checked for condition of doors, chutes, debreezers; additionally, the condition of bunkers, internally and externally, whether of reinforced concrete or steel/brick or steel, is recorded with particular note of condition of renewable tile linings.

Elevators and conveyors.—Stretch of chain is recorded and spot tests taken to assess wear of pins, rivets, side links, runner wheels; a general survey of condition of buckets made, current consumption for starting, no-load and load conditions noted; anti-runbacks and safety devices checked. The condition of supporting structure and tracks, with special regard to renewable wearing strips is noted. Driving gear is examined where possible.

Belt conveyors.—Belt condition, tension and true running. condition of head, tail and snub drums, troughing and return idlers (with special attention to lagging where used), scrapers, anti-runback gears, feed chutes, skirt plate and rubbers, are all noted.

Stoking machines.—These are very thoroughly examined under the headings of pusher mechanism, hoist gear, travel gear, charger, structure, electrics. The pusher drive, shafts, bearings, gears, ram and chain are reported on in detail. In the hoist gear the safety devices are particularly checked for free operation. The travel wheels (and condition of track rails) are carefully examined. The true running, tensioning and speed of the charger belt are noted. The structure is examined, including the coal hopper and telescopic chute.

A general report is made on operation, particularly current consumption of all motions and times of the charging and pushing operations and charge weights.

Carbonising Plant

Preventive maintenance should be an integral part of the operation of a retort house and not a series of additional duties carried out at irregular intervals; there are many operations which are rightly classed as carbonising duties but which are in effect important items of preventive maintenance.

The size of the installation, and hence the labour force, determines the extent of maintenance operations and duties which can be carried out by the stokers. On small and medium size plants a very high proportion of all maintenance can be done by the shift men, whereas on larger plants it is necessary to employ full-time personnel on settings and on the mechanical plant.

Control of heating is as much a part of maintenance as of operation. A daily visual examination should be made of all bottom and top rows of heating flues and pyrometer readings taken not less often than weekly. Where draught recorders are not employed a record of main flue draught should be made every shift and of individual flues when pyrometer readings are taken. It is often difficult to give full technical supervision on small plants; these are the cases for generous expenditure on recording instruments.

Chambers or retorts should be put under pressure at least once per week to observe external leaks at charging ports, mouthpieces, gas offtakes, etc., and to detect internal leaks into combustion chambers. External leaks should be immediately remedied; internal leaks should be noted for attention when the retort or chamber comes to its routine for washing, airborne sealing or welding.

On I.V.C. plants the lower fireclay courses must be washed over with a creamy mixture of recommended cement every two weeks, paying particular attention to vertical joints, to the bed joint and the horizontal joint between fireclay and silica. Airborne sealing is recommended; on new plants we give the first treatment before the first charge is put in and continue its use while the plant is under our control. Where vertical joints have opened excessively or where severe spalling has occurred patching by blowpipe welding should be done immediately airborne sealing or paddle patching has failed to effect a repair.

Dust accumulations should be removed from combustion chambers and heating flues at intervals depending on the nature of the ash but not longer than six months; accumulation in recuperators will probably require removal at yearly or longer intervals but must not be neglected.

Non-producer walls should be pointed and washed at approximately three-monthly intervals; sight and damper plugs and/or boxes should be painted monthly. Producer and recuperator walls should be pointed and washed at six-monthly intervals. The condition of producer cheeks should be determined at six-monthly or, at the longest, 12-monthly intervals. Bench tie rods must be inspected and checked for correct tension at three-monthly intervals.

The weekly pressure test on chambers or retorts will also reveal points of leakage at inspection and cleaning covers, valve glands, spigot and socket and flanged connections right back to retort house governor, all of which should be immediately remedied. It is emphasised that the stoking operations of cleaning the faces of charging ports, mouthpieces, and of cleaning covers and the like are essential preventive maintenance duties; their neglect will cause serious damage as well as inefficient thermal results.

RECOMMENDED SCHEDULE OF PREVENTIVE MAINTENANCE DUTIES FOR STOKERS

	NIGHTSHIFT	AFTERNOON	MORNING
Monday ..	Grease and oil spindles on r.h. governor. Oil bottom offtake spindles and producer door hinges.	Grease and oil skip head, pulleys, rope, belt and conveyor bearings.	Grease and oil bunker outlet chutes.
Tuesday ..	Clean boiler fan engine and third of boiler tubes. Check all fireclay joints on gas offtakes. Renew where necessary.	Grease and oil chamber charging bus chutes, producer charging chute, valve spindles and hinges on offtake pipe fittings. Clean third boiler tubes.	Grease and oil chimney draught regulator, travel wheels on hot coke bus. Clean remainder of boiler tubes.
Wednesday ..	Clean boiler feed pumps, quenching water pump. Change over boiler feed pump.	Grease and oil bottom door gearing, shafts and hinges.	Clean out pitch baskets on hydraulics. Scrape down hydraulics.
Thursday ..	Clean and oil liquor pumps. Change over liquor pumps.	Brush down platforms. Bench top to r.h. floor.	Brush down platforms from top of r.h. to bench top and remove any spillage.
Friday ..	Clean down hot coke bus remove all dirt accumulations from chassis and body.	Clean down bench fronts, windows tierod channels.	Clean hydraulic mains, bottom and top, gas offtakes. Bottom door gearing.
Saturday ..	Drain hydraulic mains as chambers discharge. Remove pitch accumulations. Clean baskets and refill with clean liquor.	As for nightshift.	As for nightshift.
Sunday ..	Clean liquor sprays at bottom level. Clean out seal pot on lower steaming platform.	Clean liquor sprays bench top level. Grease bottom door shafts and hinges.	Wash down r.h. floor. Clean drain channels and water sump pit.

The meticulous cleaning of I.V.C. bottom doors, whether of metal to metal or water sealed construction, is of equal importance from a maintenance point as from the carbonising angle. (This applies equally to mouthpieces on horizontal benches.) Bottom doors (hinges, catches and eccentrics) and door operating gear, manually or power operated, must have weekly examinations, lubrication and adjustment if necessary.

The cleaning of liquor sprays and checking of liquor pressure and temperature must be done every shift; adequate

spraying not only improves carbonising results but prevents accumulations of dust, tar and pitch and the resultant necessity for emergency cleaning of off-takes and mains which usually necessitates a shut down. Such ancillary items as tar and liquor pumps, quenching water pumps should have daily attention to lubrication and gland tightness. Waste heat boiler tubes must be cleaned every day and the fan drive unit should be inspected every shift, whether electric motor, steam engine, or turbine.

Mechanical Plant

The most important maintenance operation is systematic, regular, and correct lubrication. When possible the use of grease gun filled, spring-loaded stauffers on bushed bearings is recommended in preference to the hand-filled screw type, as this prevents inclusion of foreign matter and will cut down in many cases the lubrication schedule from a daily to a weekly routine.

The author has a strong preference for the use of graphite loaded grease, especially on units subject to heat such as stoking machines, chamber and producer charging cars, hot coke cars, bottom door hinges, catches and door operating gear on I.V.C. plants.

It is strongly recommended that the type of oil or grease recommended by the manufacturer of the unit be used; alternatively, the technical staff of the oil companies will survey and recommend.

Stoking Machines

Daily Duties.—Lubricate all bushed bearings and particularly those of pusher drive and of safety mechanism of hoisting gear. Clean accumulations of coal dust from D.B. charger belt, frame and pulleys.

Weekly Duties.—Lubricate gear boxes, ball and roller bearings, chain drive cases. Run out pusher ram and chain on table, examine teeth, pins, sprocket; tighten all bolts on driving gear and check meshing of gears; examine wearing strips in pusher track. (Pusher rams, chains and drive wheel should be removed before wear becomes excessive, for rebuilding of worn surfaces by welding; wearing strips must not be renewed piece-meal.) Test operation of safety gear on hoist mechanism of hanging frame. Check and adjust electromagnetic and mechanically operated brakes. Check tension and training of charger belt and of drive chains on charger and pusher. Examine all electrical controllers, renew burnt contacts and check insulation resistance of each circuit.

Monthly Duties.—Open up motors, check and clean commutators or slip rings and brushes, check stator/rotor or pole/armature clearance, lubricate bearings and blow out internal dust. Examine overhead electrical conductors and trolley arms and make insulation resistance test. Examine travel wheels for wear and check level and gauge of track rails. The machine structure should be inspected to detect and tighten up loose bolts, particularly those attaching travel and hoist bearings to the frame.

Other Duties.—Hoist wires should be examined every three months. Hoist chains must be removed, tested and annealed every 14 months. Sheave pulleys should be examined for excessive grooving each time the ropes or chains are renewed.

Skip Hoists

Weekly Duties.—Lubricate runner wheels and hoist bale pins of skip, bearings of automatic loading chute, running screw reversing gear, over-run limit switches, rope sheaves, check oil level of gear box, check and adjust reversing gear to avoid slack rope or over winding; check operation of ultimate limit switches, clearance of clapper gap and shoes of electromagnetic brake. Check time cycle for filling and emptying of skip bucket and adjust if required.

Monthly Duties.—Clean hoisting and balance weight ropes, examine for wear, re-grease with correct rope lubricant, check and take up stretch—this should be done daily after fitting new ropes—clean and lubricate balance weight rods and springs. Examine skip bucket, feed hopper, and chute and dump hopper for wear and necessary renewal of tile liners.

Three-monthly Duties.—Check track for gauge, tightness of joints, need for renewal of wearing strips.

Elevators and Conveyors

Daily/weekly Duties.—If elevator or G.B. and L.B. chains are fitted with grease nipples for hand lubrication, a section should be done every day so that the longest interval does not exceed a week. Automatic lubricators should be put on for about an hour every other day. Bushed bearings on drive, tension, bend shafts, and driving gear should have daily attention unless spring loaded stauffers are fitted, when lubrication once or twice weekly should be sufficient, depending on the hours of use and situation of the unit.

Chain tension, particularly of elevators and D.B. conveyors on hot coke, should be checked and adjusted weekly. The true running of belt conveyors should have constant supervision and skirt plate rubbers should be adjusted at least weekly. Belt cleaning devices may require daily examination and adjustment. Anti-run back gears must be checked at least weekly.

Monthly Duties. Tension of G.B. and L.B. and belt conveyors should be checked and adjusted; the stretch of De Brouwer conveyors handling coke must be measured and the correct oversize sprocket teeth fitted when required; uneven stretch between strands or uneven wear between carrying and return sides of chain can be balanced by reversal of chain in sections or complete lengths.

Belt conveyor troughing and return rollers should have a greasing schedule to ensure attention at four-weekly intervals for plain bearings, and 8-12 weekly intervals for ball bearing type. Rubber covered return rollers must be inspected at least monthly. A check of starting, no-load and full-load current consumption should be made fortnightly or at least monthly.

Other Duties.—As the monthly examinations of chains reveals increasing stretch spot tests should be made of pins, rivets, side links and runner wheels to determine the extent of wear and to prevent chain breakage, by a system of either constant renewal of worn components or sections of chain or even full replacement. Carrying and return tracks should be checked for gauge, level and condition of renewable wearing strips not less frequently than six monthly.

Electrical Equipment

Motors.—The commutators and brushes of D.C. motors should be inspected and cleaned—at weekly intervals for heavy duty reversing motors and at monthly intervals for constant direction machines, particular attention being paid to the commutator end ring. On slip ring motors a three-monthly examination and cleaning of rings and brushes should be adequate, but heavy duty reversing motors may require monthly attention. Squirrel cage motors of the totally enclosed type with ball bearings will run for six months between examinations.

Oil ring bearings require weekly filling; grease filled ball bearings will usually run for six months between greasing except where motors are in hot atmosphere. Motors with oil ring bearings should have the air gap between rotor and stator checked every three months. All motors should be blown out and have an insulation resistance test when opened up for commutator/slipring/brush examination and cleaning, and not less frequently than three months.

Outer casings must be kept free from dust and dirt to allow full cooling and prevent overheating and breakdown of insulation.

Switchgear.—Weekly cleaning and examination of controllers and speed regulators is necessary to remove dust; check fingers, segments, springs; the cleaned segments, etc., should be lightly coated with vaseline. In some cases of

heavy duty work (stoking machine pusher and travel motors) daily attention is advisable. When fitting new segments and fingers to controllers particular attention must be paid to the accuracy of fitting to ensure simultaneous and even make and break.

Self resetting limit switches should have a weekly check for free mechanical operation and electrical contact. Contactor panels should have examination and cleaning monthly, particularly overload and no-voltage trips, and oil level on time-lag dash pots; this oil must be changed twice per annum for the correct seasonal grade. Circuit-breakers require six-monthly cleaning and checking for operation. Wire fuses should be examined after six months and the gauge of wire checked; wire which has been overheated should be renewed.

Wiring.—All circuits should have an insulation resistance test at least three monthly, particularly rubber covered cables, and a record kept to show any deterioration in the insulation.

DISCUSSION

Mr. J. M. Webber (South Eastern) emphasised that it was vital that the operators be the first line of defence. Once they introduced any parallel line of defence with specialised maintenance men the operators tended to lose interest. The man whose 'hand was on the knob' was the man whose first duty was to see that the knob worked. Cleanliness was a first essential because of its great psychological effect. No one could work up any interest in dirty plant. The second line of defence was close personal contact between foreman, charge-hand, engineer, chemist, whatever they might call him, right up the scale from the plant operator. The latter must have someone to talk to about any necessary maintenance job, or he would otherwise go off the shift and forget all about it. If their men wore out their boots they would have a well run works, said Mr. Webber; if they wore out the seats of their trousers they would have a badly run works. The best works were those where the chief walked round every few hours. A longer view must be taken of maintenance. He instanced the case of one works where they instituted a regular system whereby the assistant engineers were asked to schedule all their maintenance jobs for the season. This enabled a lot of overlapping to be avoided. For this plan a day in March was much better than a day in November. For proper maintenance it was important to have intimate liaison with the stores, which must include an automatic re-ordering schedule.

Dr. J. Burns (North Thames) said they were grateful to Mr. Morland Fox for pinpointing this question of maintenance. The best load factor could only be obtained by applying the type of maintenance recommended in the paper. He knew of many cases where C.W.G. plant was kept in production by proper maintenance for 344 days in the year. Similarly, they could maintain all the ironwork on their coal gas plant, but they could not maintain their refractories to give a life better than 83%. They appreciated all the possibilities of airborne sealing and patching, but the final answer lay in the necessity for better refractories than they were getting at the moment.

Mr. E. O. Rose (Eastern) questioned the amount of outside control they should have in regard to maintenance. He had a theory that they should as far as possible let a man set his own task. If they gave him a perfectly free hand, however, he would do certain jobs which he liked doing and fail to find any faults involving jobs which he did not like doing. There should be an independent inspectorate to check the tasks. In the Eastern Gas Board they followed this plan wherever the provisions of the Factory Act were concerned. The production engineer was the man who should keep the records and set the tasks. He took as his pattern the system of aircraft servicing; although such a high standard was not necessary on all gasworks plant there were certain items on which they should approach that standard. Mr. Rose stressed the danger of not giving proper maintenance to plant just because it continued to give trouble-free service. He instanced the case of a turbo-blower which had been working satisfactorily for 25 years; yet when they inspected it they found ½ cwt. of gum on the impeller which would have caused a serious breakdown at any moment.

Mr. A. F. Grant (North Thames) referred to the view that maintenance must start with the personnel who operated the plant. This presupposed exceptionally good foremanship followed up by adequate supervision. He suggested that in the matter of inspecting mechanical plant the proper man to do it should be not below the rank of charge-hand, who should be the liaison with the foreman to obtain all the information on the site. Such information should form the basis for the programme of maintenance for the immediate future. Mr. Grant thought Mr. Morland Fox was expecting rather a lot from his suggested system of recording. Such records would have to be kept in considerable detail in the manager's office. On smaller works where technical supervision was not continuously available an elaborate system of instrumentation would have to be installed to do some of the supervising. But if they put in instruments to assist maintenance, they must also provide someone to maintain the instruments.

Mr. C. A. Deas (Eastern) made a plea for plant to be designed for easier maintenance. It was one thing to build fine new plant but quite another thing to get at the various parts for proper maintenance.

Author's Reply

Mr. Morland Fox, replying to the discussion, said he was glad that everyone agreed that the first line of defence in maintenance was in the hands of the plant operator. The predominant thing, however, was the periodical overhaul of all machines. While the engineers should put in a list for correlation, that did not meet the full case. A plant inventory was the final check. As regards the question of spares, Mr. Morland Fox recommended carrying 5% of the actual value of the plant as expendable spares. He emphasised the importance of 'indoctrination'—that was the continual telling of the men the value of plant maintenance. The plant inventory must be kept in much more detail in the manager's office than in the accounts department. The maintenance of instruments was not so major a task as the maintenance of plant. As regards Mr. Deas' comments, he agreed that the designers of gasworks plant often failed to appreciate the need for maintenance. They were fully conscious of it and realised its importance.

Mr. J. W. Townsend (South Eastern), in proposing a vote of thanks to Mr. Morland Fox for his paper, emphasised the great importance of a detailed plant inventory. They must pretty well dissect the plant to reach a basis for spares. He recommended the adoption of graphical methods to indicate the maintenance required on major items of plant. Airborne sealing, he said, must be adopted from the start and not after the plant had been at work some time. The firm's report service was very valuable.

Mr. J. C. Hogg (Southern), in seconding the vote of thanks, said that this was the time of year to set about this business of maintenance. It was well worth a little planning.

IMPERIAL COLLEGE OF SCIENCE

In the course of its 45th annual report, for 1951-52, the governing body of the Imperial College of Science and Technology refers to the financial difficulties with which it was faced during the last half of the quinquennium 1947-1952, owing to rapidly increasing costs. Two years ago the position was obviously deteriorating, and might well have become serious if strong remedial action was not taken, and a sustained effort made to balance the budget. The result of the combined effort made by all members of the college has been that, at the cost of real sacrifices all round, it was possible to complete the quinquennium with an accumulated excess of expenditure over income of only £19,451, far less than appeared likely two years ago.

Steps are being taken to make good this loss, and with the funds placed at the disposal of the authorities for the first year of the new quinquennium it is hoped to continue the work of the college without being faced with the necessity of reducing any important part of the normal programme.

STANDARD FOR LIGHTING FITTINGS

The British Standards Institution has published a revision of B.S. 364, neck and flange dimensions of interior lighting fittings. This British Standard, which was first published in 1929 and was revised in 1934, has now been extended to cover openings in shades and reflectors for electric and gas light fittings, and also covers neck and lug dimensions of bayonet pattern globes, or shades and galleries.

Copies may be obtained from the British Standards Institution, Sales Branch, 24, Victoria Street, London, S.W.1. Price 2s. 6d.

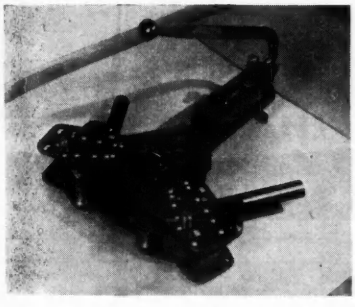
TRADE NEWS

Tubela Engineering Co.

THE Tubela Engineering Co., Ltd., which designs and manufactures 'Tubela' tube bending machines and also specialised cutting tools, will now distribute its products through normal trade channels instead of as formerly through a sole distributor.

Lawler, Ayers & Co., Ltd., who, for a number of years have acted for the company in this capacity, will cease to be the sole distributing agents.

This step, we understand, has been taken for a variety of reasons—the most important of which is the rapidly increasing demand for the company's products resulting in the need to establish efficient servicing facilities. Servicing is not easy when the makers are not in touch with customers and, in an industry where equipment has often to be specially designed, personal contact is essential.



The H.3 hydraulic machine with the 2 in. wing head in position.

Distribution is being organised on a nation-wide basis, and the company's representatives—men with considerable practical experience—will be available throughout the United Kingdom to offer expert advice and to deal with problems on the spot. The company informs us that they have already had a very considerable response from dealers and users all over the country, and there is no doubt that the step they are taking is going to be widely welcomed.

Tubela has had an interesting history. It was formed some years ago by two working engineers who had spent half a lifetime in this particular branch of the engineering industry. They have been responsible for designing the entire range of equipment which now bears the company's name. Of particular interest is the extreme bending unit designed as an attachment for the H.3, facilitating the bending of ½ in. to 2 in. steam and gas tubes to 180°—the first machine of its kind to be designed and marketed in the United Kingdom. The company manufactures its entire range of products and conducts its servicing activities at its Bow factory.

Illustrated is the H.3 hydraulic machine which operates by the exertion of hydraulic power on to a ram which presses the former against the pipes to be bent which is held in position on what is known as 'wing head.' Application for patent of this machine is pending. The hydraulic operates and exerts a pressure of up to 10 tons under normal working conditions. The machine bends gas and steam pipes of ½ in. to 3 in. diameter.—*Tubela Engineering Co., Ltd., 3, Furze Street, London, E.3.*

Hymatic Engineering Co.

Design changes and improvements in the range of industrial compressed air rectifiers and reducing valve units produced by the Hymatic Engineering Co., Ltd., have resulted in the development of a single high precision model capable of meeting all the diverse operating conditions previously catered for by four alternative 'Hymatic' units. The maximum inlet pressure is now 200 lb. per sq. in.

The new rectifier, type R50, effectively removes both oil and water from high pressure air supplies and delivers dry clean air at controlled pressures. This prevents corrosion and undue wear in pneumatic tools, jigs, and fixtures and eliminates costly production stoppages arising from the need for too frequent overhauls. For spray painting the rectifier is particularly valuable as no spray gun can give a first-class finish with oil and water in the air supply.

Each rectifier can be used with up to three average industrial spray guns or combinations of guns and tools, consuming up to 25 cu. ft. per min. at accurately determined pressures ranging from 20 to 180 lb. per sq. in.—*Hymatic Engineering Co., Ltd., Redditch, Worcs.*

J. H. Robinson & Co. (Liverpool)

Two latest two-ton "Thames" Fordson vans recently put into service by J. H. Robinson & Co. (Liverpool), Ltd. They are finished in the firm's standard colours of two tones of grey.

Trade Publications

GEO. W. KING, LTD., Hitchin, have published a leaflet describing a recent addition—the 'Maton'—to their range of electric pulley blocks. It weighs only 32 lb. and has lifting speeds of 50 ft. or 100 ft. per min., with capacities of 100 or 200 lb. It is exceedingly compact.

MATHEW BROS., Wallington, Surrey, send particulars of the 'Matbro' bulk loader—a fork truck capable of travelling anywhere. The principle of an elevating front mast is adaptable and can be utilised to lift and transport all kinds of awkward loads. The loader can be fitted in a few minutes with shovel, dozer blade, fork lift attachment, or crane jib. Other attachments are being designed.

SIEBE, GORMAN & CO., LTD.—Tolworth, Surbiton, Surrey, send us a copy of their booklet dealing with self-contained breathing apparatus (oxygen and compressed air types). Courses, normally lasting five days, are held regularly at the firm's works under experienced instructors. Theoretical and practical instruction in the use of breathing apparatus generally is given, with detailed instruction in the use, care, and maintenance of the type of apparatus used by the student in his employment.

The LOCOMOTIVE MANUFACTURERS ASSOCIATION OF GREAT BRITAIN, 82, Victoria Street, London, S.W.1, forward a copy of 'British Diesel Locomotives and Railcars.' This is the first publication issued collectively by the British diesel locomotive manufacturers. It is designed primarily to provide a semi-technical reference for commercial representatives of the Government who may thus be put into the position of being able to advise prospective buyers as to the manufacturers who are the most likely to meet their particular requirements.

LANCASHIRE DYNAMO GROUP

THE REGISTERED OFFICE of Lancashire Dynamo Holdings, Ltd., has been moved to St. Stephen's House, Victoria Embankment, London, S.W.1 (Tel.: Whitehall 7211).

At this new address also are located the registered office, London sales office, and export department of Lancashire Dynamo & Crypto, Ltd. (Whitehall 7211); the export and London and Home Counties sales offices of Lancashire Dynamo Switchgear, Ltd. (Whitehall 2751); the export and London and Home Counties sales offices of Crypton Equipment, Ltd. (Whitehall 2751); and the office of Lancashire Dynamo Group Publicity Services (Whitehall 2751).

No changes have been made to the telegraphic addresses of any of the companies.

THE POWER-GAS CORPORATION, LTD., licensee for the Pease Anthony scrubbers, now has a pilot plant unit available to run first. But a badger will have for experimental purposes on a variety of applications. The unit, which is mobile, can handle 500 cu.ft. of gas per min. and is capable of dealing with micron and sub-micron dusts and fumes.